PARAMETERIZATION TOOL

Landis+Gyr

MAP120

USER MANUAL

H 71 0200 0067 h en

Revision History

Index	Date	Comments
-	20.04.2000	Preliminary Draft for Version 1.0
a	10.10.2000	Adaptation to Version 1.1
b	15.02.2001	Adaptation to Version 1.2
c	20.07.2001	Adaptation to Version 1.4
d	23.08.2002	Adaptation to Version 2.0
e	16.02.2004	Adaptation to Version 2.1, Total revision
f	04.11.2004	Adaptation to Version 2.2
g	20.12.2004	Adaptation to Version 2.3, New designation of the tool
h	23.03.2005	Adaptation to Version 2.4, license dialog

subject to technical changes

Landis+Gyr AG
Feldstrasse 1
CH - 6301 Zug
Switzerland
Phone: +41 41 935 60 00
www.landisgyr.com

Introduction

Scope

The present user manual is designed for the Landis+Gyr MAP120 Parameterization Tool **Version 2.4**.

Purpose

This user manual contains all information required for the use of the Landis+Gyr MAP120 Parameterization Tool. It not only provides explanations concerning functionality and general procedures, but also gives detailed, illustrated instructions on how to use the software.

Target group

The contents of this user manual are intended for technically qualified personnel of energy supply companies responsible for the system planning, parameter setting and installation of meters.

Conditions

The Landis+Gyr MAP120 Parameterization Tool runs on personal computers with the Windows operating system. To understand this user manual, you need basic knowledge of Windows and its terms, as well as a general idea of how to operate a personal computer. Furthermore, you need to be familiar with the functional principles of the various meters supported by the Landis+Gyr MAP120 Parameterization Tool, which are described in the corresponding user manuals.

Conventions

The following conventions are used in this manual:

1. 2. 3.	Ordinal numbers are used for individual steps in the instructions.
View	Buttons, menu names and individual menu items appear in bold text.
[F1]	Keys are shown in square brackets.
[Ctrl]+[S]	Key combinations are shown with a plus sign (e.g. [Ctrl] key kept pressed while pressing [S] key)
"Open"	Names of windows, directories and elements appear in quotation marks.

© Landis+Gyr AG

Table of Contents

1 Overview 9
1.1 Functions 9
1.2 Versions 10
1.2.1 Demo version 10
1.2.2 Service Edition 10
1.2.3 Remote Service Edition 11
1.2.4 Professional Edition 11
1.2.5 Remaining Versions 11
2 Installation 13
3 Licensing 15
3.1 Introduction to the Licensing Concept 15
3.2 Entering License Data 16
4 First Steps 17
5 Communication with Meters 21
5.1 MAP120 Communication Center 21
5.1.1 Types of Tree 22
5.1.2 Communication Profiles 22
5.1.3 Interface to Meter 24
5.1.4 Access Levels 26
5.1.5 Addressing Meters 27
5.2 Communication Examples 28
5.2.1 Local Point-to-Point Connection via Optical Reading Head 28
5.2.2 Local Point-to-Point Connection via RS232 Interface 28
5.2.3 Local Multiple Connections via RS232/RS485 Interfaces 30
5.2.4 Remote Point-to-Point Connection via V34 PSTN Modem 34
5.2.5 Remote Multiple Connection via V22bis PSTN Modem 36
5.2.6 Remote Point-to-Point Connection via GSM Modem 40
5.3 Reference to Other Documents 42
6 Description of Types of Tree 43
6.1 Survey 43
6.2 dlms Tree 45
6.3 Tree for Billing Values and Profiles 50
6.4 Service Tree 51
6.5 IEC Service Tree 53
6.6 Parameterisation Tree 55

© Landis+Gyr AG

6.6.1 Switching the Certification Feature On or Off 56
6.6.2 Comparing Parameterisation Tree to File 57
6.6.3 Comparing Parameterisation Tree to Meter 59
6.6.4 Exporting TOU Table 60
6.7 Installation Tree for GSM 61
7 Data Handling 63
7.1 Event Log Data 63
7.2 Load Profile Data 66
7.3 Stored Values 69
8 Application of MAP120 Functions 71
8.1 File Handling Functions 71
8.1.1 Creating New Device Descriptions 71
8.1.2 Opening Existing Device Descriptions 73
8.1.3 Closing Device Description Windows 75
8.1.4 Saving Device Descriptions 75
8.1.5 Saving Device Descriptions under a New Name 75
8.1.6 Printing Device Descriptions 76
8.1.7 Defining the Print Layout 78
8.1.8 Previewing the Printout on the Screen 80
8.1.9 Setting up the Printer 83
8.1.10 Terminating the Program 83
8.2 View Functions 84
8.2.1 Expanding and Collapsing Tree Folders 84
8.2.2 Switching the Toolbar On and Off 84
8.2.3 Switching the Message and Status Bar On and Off 85
8.2.4 Reset Tree Icons 86
8.2.5 Searching Items 87
8.3 Special Functions 88
8.3.1 Calling up Licensing Functions 88
8.3.2 Specifying General Tool Settings 88
8.3.3 Reloading Configuration Settings Saved 90
8.4 Window Arrangement Functions 91
8.5 Help Functions 92
8.5.1 Displaying Help Topics 92
8.5.2 Calling up Context-Sensitive Online Help 93
8.5.3 Displaying Help Support 94
8.5.4 Displaying the Current Version of the Program 95

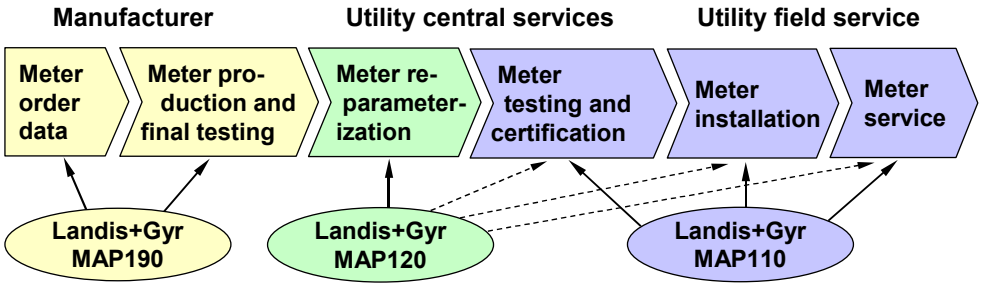
9 De-installation 97
10 Support 99
11 Description of Meter Security System 101
11.1 Introduction 101
11.2 Access Levels 101
11.3 Security Attributes 102
11.4 Access Levels and their Application 103
11.5 Allocation of Access Rights 105
12 Formatted Commands According to IEC 62056-21 107
12.1 Definitions 107
12.2 Communication Errors 109
12.3 Formatted IEC Commands 109
12.4 Formatted VDEW Commands 112
13 OBIS Identification Codes 115
13.1 General Description 115
13.2 Examples 118
14 List of Abbreviations 123
15 Index 125

© Landis+Gyr AG

1 Overview

The Landis+Gyr MAP120 Service Tool was developed to support the dialog meters. It is able to communicate with all modern electronic meters from Landis+Gyr and also with many units from other manufacturers, which comply with the standards according to dlms or IEC 62056-21 (formerly IEC 1107). The Landis+Gyr MAP120 Parameterization Tool is therefore an ideal aid for the service engineer.

The following diagram illustrates the various fields of application of the Landis+Gyr MAP120 Parameterization Tool for power supply companies. The fields of application of the Landis+Gyr MAP110 Service Tool and the Landis+Gyr MAP190 Parameter Editor are also shown.



1.1 Functions

The range of functions of the Landis+Gyr MAP120 Parameterization Tool covers all the following applications normally required for meter installation and in the service sector:

- Parameter readout and modification (only for Landis+Gyr meters)
- Billing data readout
- Readout and export of profiles (load profile, stored values and event log)
- Execution of IEC commands
- GSM installation aid for Landis+Gyr communication units (field strength indicators, telephone number information, pin-code handling)

The Landis+Gyr MAP120 Parameterization Tool can communicate with numerous meters independent of manufacturer, type, etc., which support the standards of dlms or IEC 62056-21. This also includes all additional functions according to the VDEW specifications.

Communication channels RS232, RS485, CS, PSTN and GSM are supported.

© Landis+Gyr AG

1.2 Versions

To ensure the maximum possible flexibility for users of the Landis+Gyr MAP120 Parameterization Tool, the software can be licensed for various versions (user groups) with different functionality:

- Demo
- Service Edition
- Remote Service Edition
- Professional Edition
- Service Center Edition
- Group Company Edition
- Head Quarter Edition

The version is determined by the licence data (see chapter 3 "Licensing"). Each license exclusively applies to an individual version.

The following table shows the executable functions of all the versions (user groups).

					Version (User Group)
					Demo
					Service Edition
					Remote Service Edition
					Professional Edition
					All remaining versions
					Functions
•	•	•	•	•	dlms support
•	•	•	•	•	IEC support
•	•	•	•	•	Service tree
			•	•	Parameterization tree
		•	•	•	Remote communication (PSTN and GSM)
	•	•	•	•	Writing data into meter
	•	•	•	•	Printing data and writing into file
			•	•	Record communication

1.2.1 Demo version

The Demo version (with limited range of functions) is available free of charge to all users, who wish to become familiar with the design and function of the Landis+Gyr MAP120 Parameterization Tool.

1.2.2 Service Edition

With the Service Edition all functions are available on the spot for maintenance, installation, testing and certification of meters.

1.2.3 Remote Service Edition

The Remote Service Edition has additional communication functions for remote parameterising and GSM support.

1.2.4 Professional Edition

The Professional Edition permits all useful functions required in a productive environment, i.e. it provides additional possibilities for meter parameterisation, as well as communication analysis functions. This version has full access to all parameters with the parameterisation tree.

1.2.5 Remaining Versions

The Service Center Edition, Group Company Edition and Head Quarter Edition are still present for continuity reasons, are however hardly still used. They have all the same functional range as the Professional Edition.

© Landis+Gyr AG

2 Installation

This chapter describes the installation of the Landis+Gyr MAP120 Parameterization Tool on the hard disk of your personal computer.

System requirements

To be able to run the Landis+Gyr MAP120 Parameterization Tool, your personal computer must meet the following minimum requirements:

- Pentium processor with > 400 MHz
- 128 MB of RAM
- 40 MB of free space on the hard disk
- 256 color VGA graphics card and monitor
- CD drive (if software delivered on CD)
- pointing device (mouse)
- Operating system Windows 98, NT, 2000 or XP
  (Windows CE and ME are not supported)

Installation software

The corresponding installation software is required to install the Landis+Gyr MAP120 Parameterization Tool. This can either be found on the installation CD "Landis+Gyr MAP120" or it can be downloaded to your PC via the Internet from the homepage www.landisgyr.com.

Notes

Administration rights are required for the installation, if the Windows NT, 2000 or XP operating system is used on your PC.

If a version of the Landis+Gyr MAP120 Parameterization Tool is already installed on your computer, this must be removed before installation (the license is retained).
Exception: a parallel installation of the Landis+Gyr MAP120 Parameterization Tool of versions 2.0 and 2.x is permitted, but they must be installed in different folders.

All open Windows applications must be closed before installation.

Please read the file "Readme.txt" with current information about the present version of the Landis+Gyr MAP120 Parameterization Tool.

Procedure

Start the installation file "Setup.exe" and then follow the instructions on the screen.

© Landis+Gyr AG

3 Licensing

This chapter explains the licensing concept and describes the steps necessary for licensing the Landis+Gyr MAP120 Parameterization Tool.

3.1 Introduction to the Licensing Concept

Following installation of the Landis+Gyr MAP120 Parameterization Tool the application is automatically licensed as Demo version, i.e. it can only be used with reduced range of functions. For unrestricted use of the Landis+Gyr MAP120 Parameterization Tool it must be licensed for the provided field of application. For this, Landis+Gyr provides you with the following license data, to be entered in the Landis+Gyr MAP120 Parameterization Tool:

- User Name
- User Group (Version)
- License Key

The procedure is described in chapter 3.2 "Entering License Data".

The user group determines the functional range of the Landis+Gyr MAP120 Parameterization Tool (see also chapter 1.2 "Versions"). The following user groups exist:

- Demo
- Service Edition
- Remote Service Edition
- Service Center Edition
- Group Company Edition
- Head Quarter Edition
- Professional Edition

The license is valid for an unlimited time. The same license data can be used for several MAP120 installations.

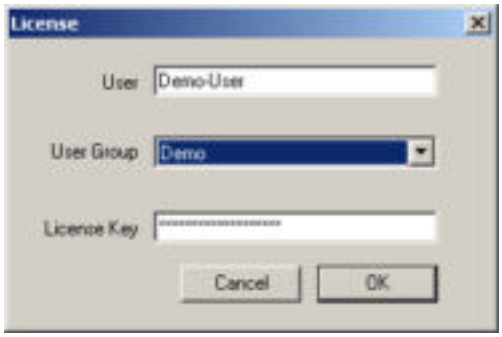
© Landis+Gyr AG

3.2 Entering License Data

This chapter describes the licensing procedure required for unrestricted use of the Landis+Gyr MAP120 Parameterization Tool. The license data received from Landis+Gyr following your order is required for this purpose.

Procedure:

1. Click on **Start** and then select the **Landis+Gyr MAP120** command from the menu **Programs**, **Landis+Gyr MAP120**.
   The Landis+Gyr MAP120 Parameterization Tool is started and the "MAP120 - Communication Center" window appears.
2. Click on **Cancel** to close the "MAP120 - Communication Center" window.
3. Select **License...** from the **Extras** menu.
   The "License" window appears.

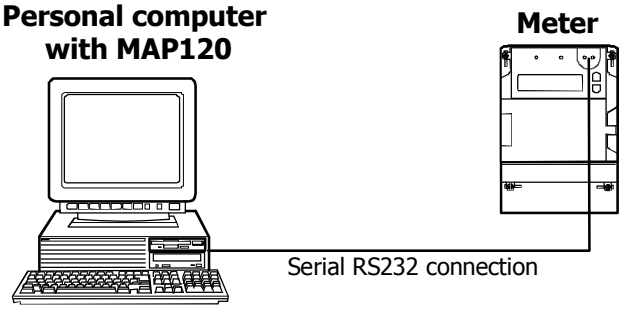


4. Enter the user name provided by Landis+Gyr in the "User" entry box.
5. Select the user group provided by Landis+Gyr in the "User Group" selection field.
6. Enter the licence key provided by Landis+Gyr in the "License Key" entry box. To prevent from illegal copying placeholders are shown instead of the license key after input.
7. Click on **OK**.
   The licensing procedure is terminated.

   The Landis+Gyr MAP120 Parameterization Tool is now ready for use according to the instructions given in chapter 4 "First Steps" or 8 "Application of MAP120 Functions", respectively.

4 First Steps

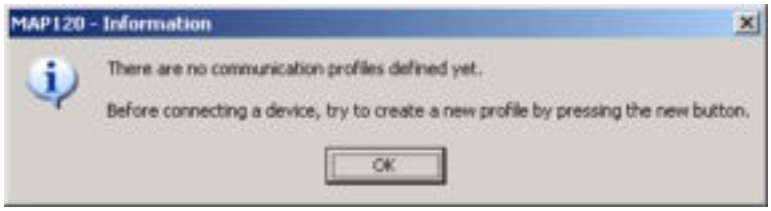
This chapter gives an introductory example of how a communication connection is made to a meter with the Landis+Gyr MAP120 Parameterization Tool and how data can be read from the meter.



A meter ready for operation and an optical reading head for connection to a serial interface are required for this purpose. The Landis+Gyr MAP120 Parameterization Tool must also be installed on the PC.

Procedure:

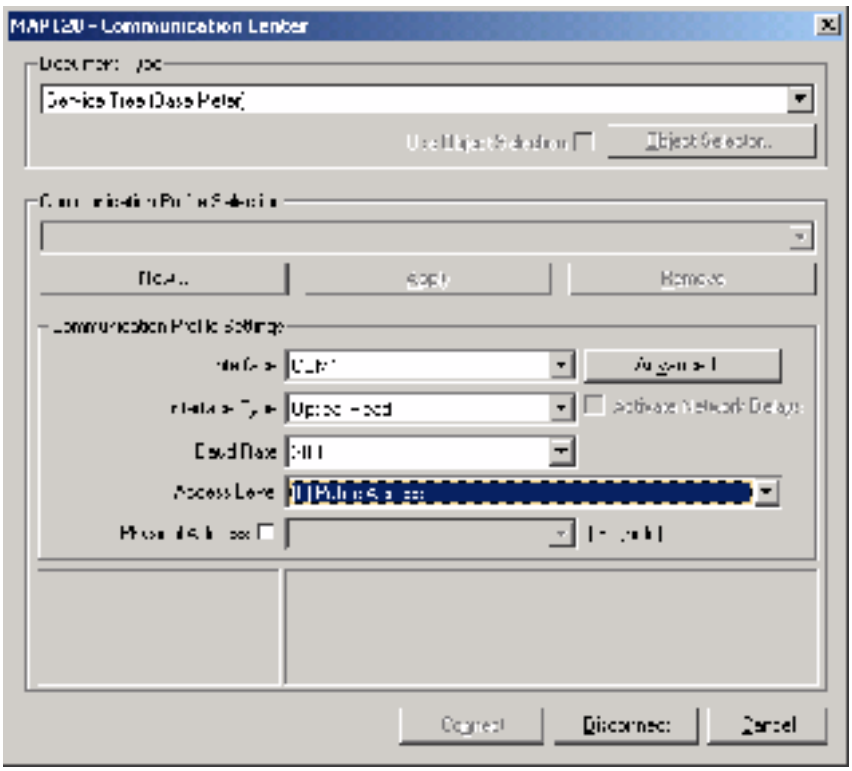
1. Switch off the PC.
   Connection of a unit with the PC switched on could damage the PC or the unit.
2. Connect the cable of the optical reading head fitted on the meter to the serial interface of the PC.
3. Start the PC.
4. Click on **Start** and then select the **Landis+Gyr MAP120** command from the menu **Programs**, **Landis+Gyr MAP120**.
   The Landis+Gyr MAP120 Parameterization Tool is started and the following message appears, if no communication profiles are yet defined:


MAP120 - Information
There are no communication profiles defined yet.
Before connecting a device, try to create a new profile by pressing the new button.
OK

5. Confirm this message with **OK**.
   The "MAP120 - Communication Center" window appears. All communication settings must be made here as shown below. More detailed information can be found in chapter 5.1 "MAP120 Communication Center".
6. In the selection box "Document Type" select the document type "Service Tree (Base Meter)".
7. In the selection box "Interface" select the serial interface to which the optical reading head is connected.
8. In the selection box "Interface Type" select "Optical Head".
9. In the selection box "Baud Rate" select "300".
10. In the selection box "Access Level" select "[0] Public Access".

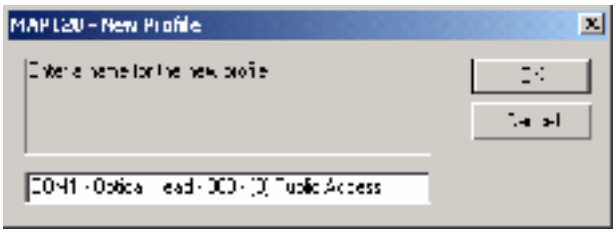
© Landis+Gyr AG

Setting up a communication profile



11. Click on **New...**.
    The "MAP120 - New Profile" window appears.

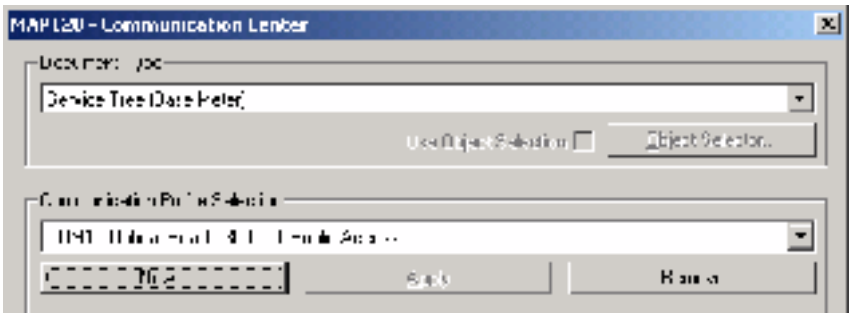
Saving the communication profile



12.

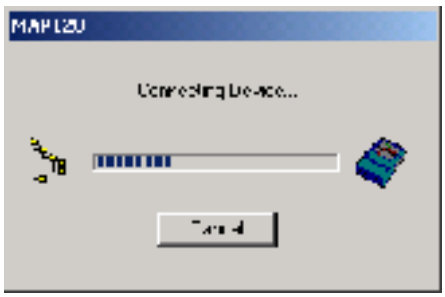
13. Enter a name for the new profile or leave the proposed name.
    The proposed name is made up from the main settings of the profile.

14. Click on **OK**.
    The new profile is saved and appears afterwards in the selection box "Communication Profile Selection".

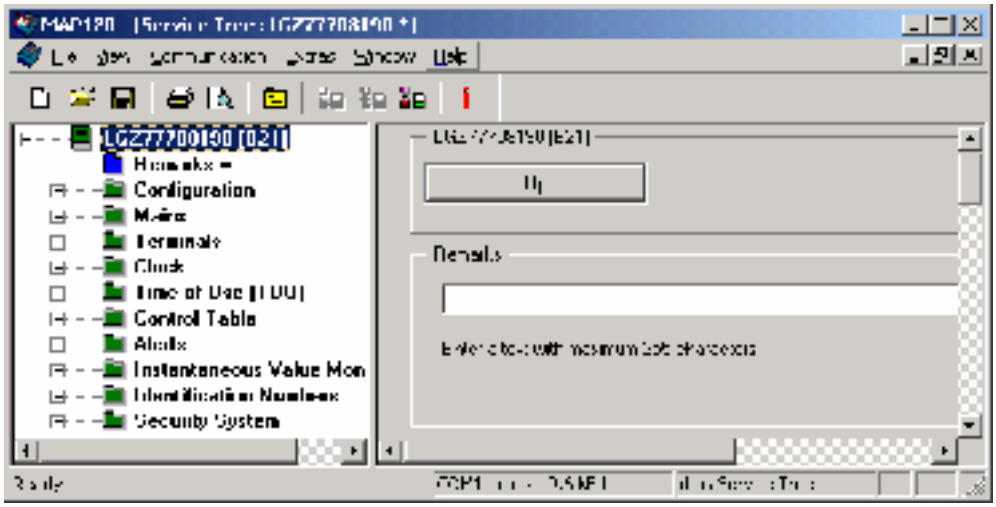


15. Click on **Connect**.
    The communication is started and the meter model is loaded from the connected meter. During this operation, which can last up to several minutes depending on the number of objects to read, a progress bar is displayed.

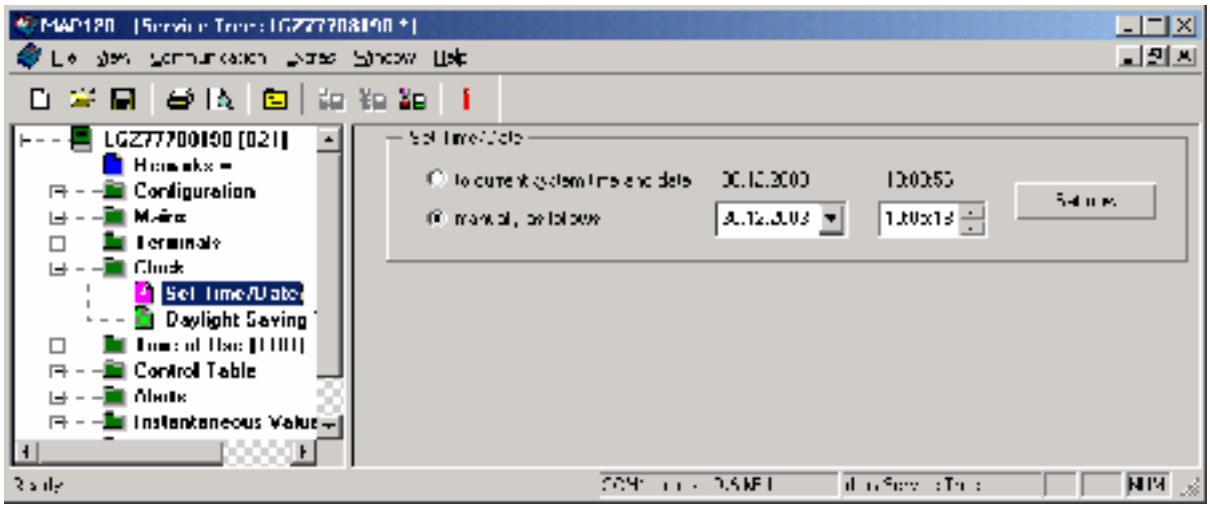
Establishing communication connection and reading data



After termination of the readout the loaded meter model is displayed in the Landis+Gyr MAP120 Parameterization Tool.



16. Expand the tree structure to the extent that the desired item becomes visible, in this example the items of the calendar clock, to allow checking of date and time. To do so click on the corresponding expansion sign ⊞ in the tree and then on the item "Set Time/Date". Enlarge the window size to see all the relevant details.



17. Click on in the toolbar or select **Disconnect from Meter** from the **Communication** menu.
The meter is disconnected (the status displayed in the status bar changes to "Disconnected").

18. Select **Exit** from the **File** menu.
After an inquiry, whether the service tree shall be saved or not, the application is terminated and all resources are released.
This concludes the introductory example. Further instructions with more detailed explanations are provided in the following chapters.

© Landis+Gyr AG

5 Communication with Meters

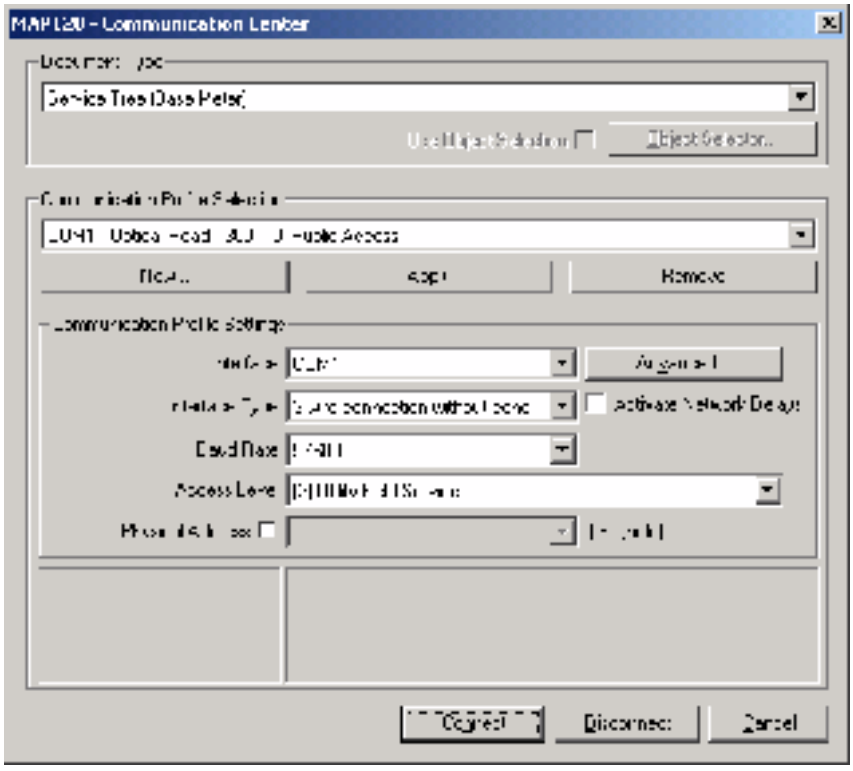
This chapter describes all aspects of communication with meters, in particular work with the MAP120 communication center for various applications.

5.1 MAP120 Communication Center

All communication settings can be made in the "MAP120 Communication Center" window. This mainly serves to select the desired type of tree and suitable communication profile, as well as to make or end a connection to the meter.

The "MAP120 - Communication Center" window appears

- following every start of the MAP120 (except when this has been suppressed in the general settings)
- after generating a new unit description (click on or select **New** from the **File** menu)
- when called up (select **Session Connector...** from the **Communication** menu).



For a better understanding of the possible settings in the MAP120 communication center some important terms and communication parameters are explained below, before the completion of various communication connections is shown by means of examples in chapter 5.2 "Communication Examples".

© Landis+Gyr AG

5.1.1 Types of Tree

The type of tree must be selected in the MAP120 communication center for every communication connection to a meter. If not specified otherwise, the trees are present both for the base meter and also for a communication unit. The following types of tree are available (depending on license):

- dlms Tree (Base Meter)
- Tree for Billing Values and Profiles (Base Meter only)
- Service Tree
- IEC Service Tree
- Parameterisation Tree (Base Meter only)
- Installation Tree for GSM (Communication Unit only)

These types of tree and their application are described in detail in chapter 6 "Description of Types of Tree".

5.1.2 Communication Profiles

Communication profiles stored in the MAP120 contain all necessary settings for a specific type of connection to a meter:

- Connection specification (interface used, type of interface, baud rate for direct connections or modem type and telephone number for modem connections).
- Access specification (access levels, passwords)
- Physical device address
- Network delay times

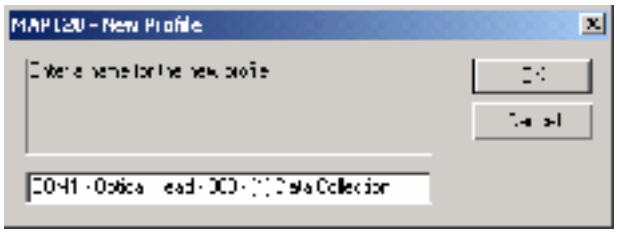
A communication profile must be determined or selected in the MAP120 communication center for every communication connection to a meter. With the choice of a stored communication profile all settings no longer have to be made separately each time. Any desired number of communication profiles can be specified and stored.

Preparation example

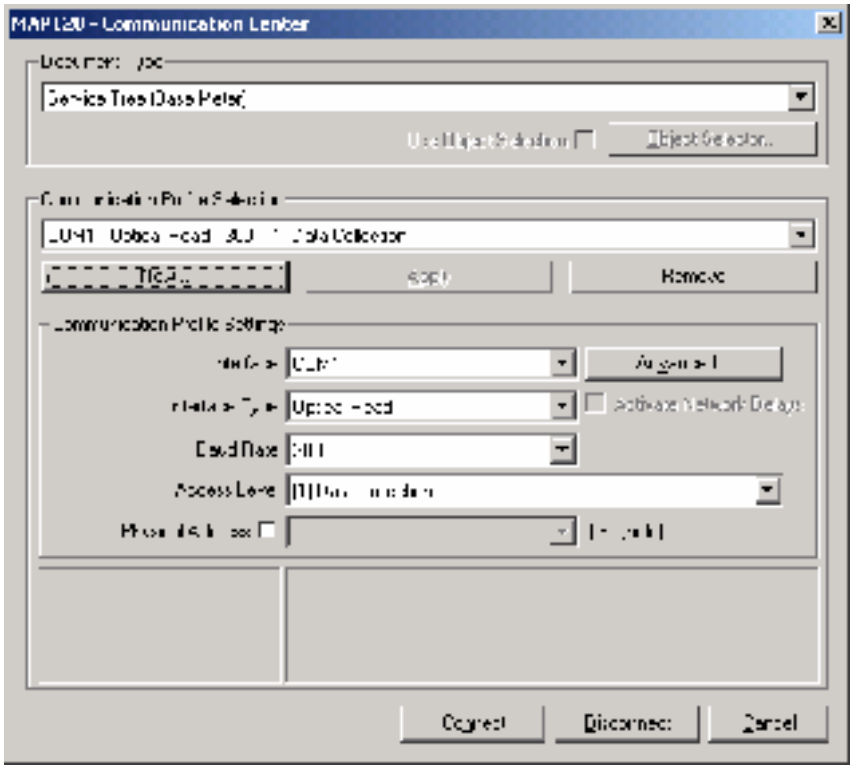
The following basic procedure should be adopted to produce and store a new communication profile in the MAP120 communication center (specific examples are given in chapter 5.2 "Communication Examples"):

1. Select the serial interface to be used in the "Interface" selection box or the modem used for remote communication.
2. For local communication select the "Optical Head" type used in the "Interface Type" selection box or "3-wire connection without echo" or for remote communication the telephone number to be selected.
3. Select the corresponding transmission rate for the meter for local communication in the "Baud Rate" selection box.
4. Select the access level required for the intended activity in the "Access Level" selection box.

5. If extended communication settings are necessary, click on **Advanced...**.
   The "MAP120 - Advanced Communication Settings" window appears.
6. Perform the required extended communication settings and then click on **OK.**
   The "MAP120 - Advanced Communication Settings" window disappears.
7. Click on **New...**.
   The "MAP120 - New Profile" window appears.



8. Enter a name for the new communication profile or leave the name suggested.
   The name suggested is formed from the most important settings of the communication profile.
9. Click on **OK**.
   The new communication profile is stored and then appears as entry in the "Communication Profile Selection" box.



© Landis+Gyr AG

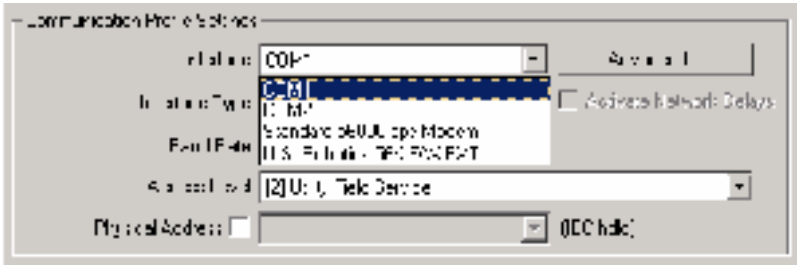
5.1.3 Interface to Meter

The communication connection from the Landis+Gyr MAP120 Parameterization Tool to one or more meters can be made in various ways:

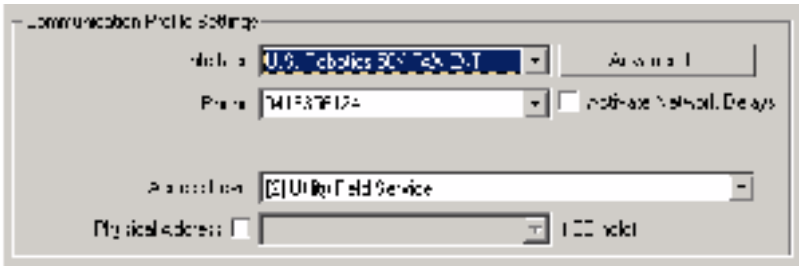
- With an optical **reading head** placed at the optical interface of the meter (only point-to-point connection to a meter possible).
- With a **direct connection** to a meter, e.g. via an RS232 interface as used in various communication units. If the communication unit has a second interface, multiple connections are possible to further meters.
- With a **modem connection** to a meter or several meters, if these are connected together by a multiple connection by RS485, CS or M-bus.

The connection to a PC with the MAP120 software is made either via a serial interface (e.g. COM-port or USB) or via a modem connected. Note: the modem must first have been installed and configured on the PC.

The interface used must be selected in the MAP120 communication center in the "Interface" selection box. The selection contains all the serial interfaces present on the PC and all modems configured, e.g.:



If a modem is selected, an entry box appears for the telephone number:



If a serial interface is selected, the "Interface Type" and "Baud Rate" entry boxes appear. The transmission rate to be entered in the "Baud Rate" box must correspond to the meter settings. "Optical Head" or "3-wire connection without echo" should be selected as interface type, depending how the meter is connected.

This is necessary because an echo signal is often produced when using an optical reading head, which can be suppressed by suitable means in the MAP120, while this effect does not occur with a direct connection.

If one of these two effects should not take place at any time (a corresponding error message is given in this case when connection is made), it can be corrected by clicking on **Advanced...** and suitably changing the characteristics of the physical interface or start protocol in the "MAP120 - Advanced Communication Settings" window appearing.

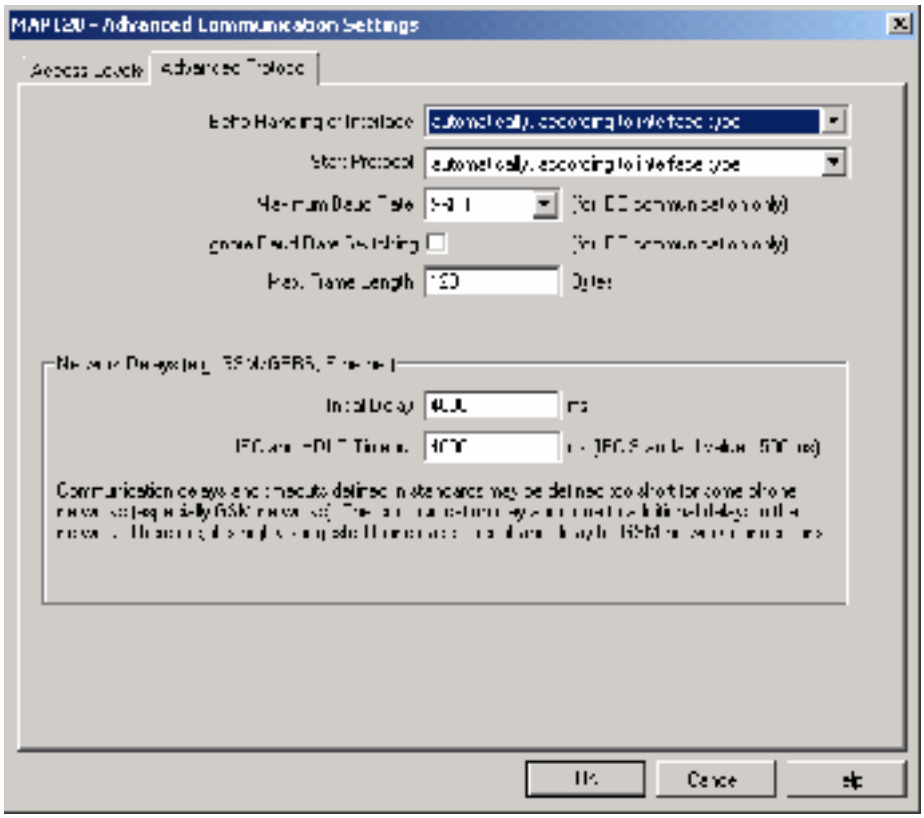
Possible settings in the "Echo Handling of Interface" selection box:

- **automatically, according to interface type** (default), i.e. with echo, if an optical reading head is used or without echo, if a direct connection is made
- **with echo (e.g. optical head)**, if a direct connection is used, which causes an echo
- **without echo (e.g. electical interface)**, if an optical reader is used, which causes no echo.

Possible settings in the "Start Protocol" selection box:

- **automatically, according to interface type** (default), i.e. IEC protocol, if an optical reader is used or HDLC protocol if a direct connection is used
- **IEC**, if the IEC protocol must be used without fail
- **HDLC**, if the HDLC protocol must be used without fail

Advanced communication settings



© Landis+Gyr AG

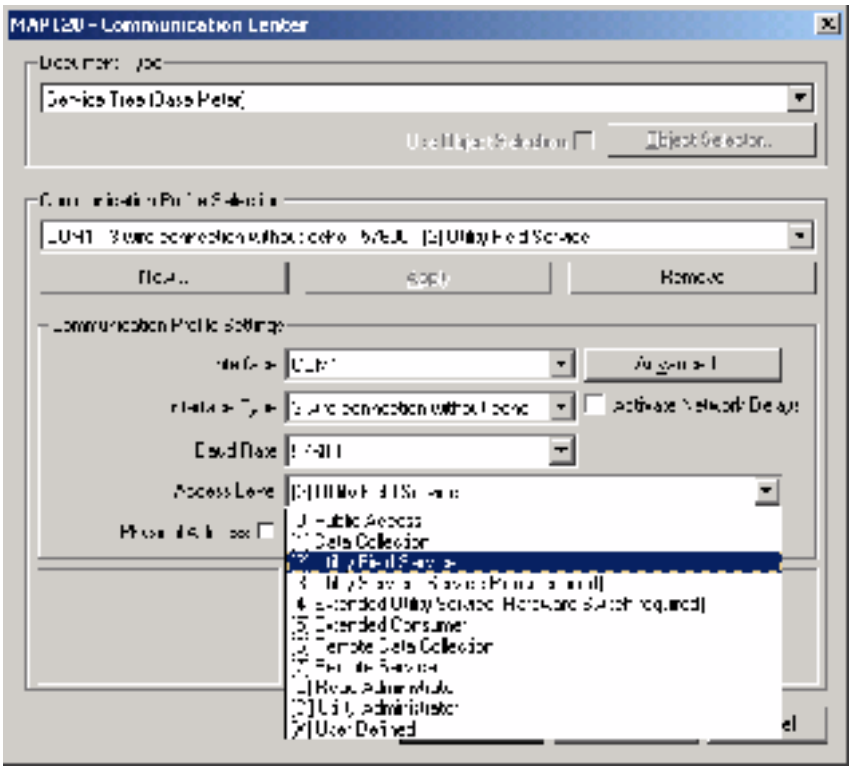
Additional setting possibilities on the "Advanced Communication Settings" register card:

- **Maximum Baud Rate** (Default = 9600)
  This can be selected in the selection box. If HDLC is selected as start protocol, no selection is possible.
- **Ignore Baud Rate Switching**
  If this check box is activated with IEC protocol selected, the starting baud rate selected is permanently retained. This is necessary, for example, for communication with meters, which must be contacted via a multiple connection with a lower transmission rate than required by the modem circuit.
- **Max. Frame Length** (Default = 128 Bytes)
  This can be entered in the entry box. The permissible range is 62 ... 248 Bytes. Landis+Gyr recommend to reduce the frame length only in case of communication problems.
- **Network Delays** (Default = 4000 ms)
  The initial delay and time-out can be set in the event of problems when making connection, e.g. in GSM networks. It should be noted that the "Activate Network Delays" check box must also be activated in the "MAP120 - Communication Center" window for this setting to be effective (otherwise the standard values of 1500 ms remain effective).

5.1.4 Access Levels

An access level must be selected for every communication connection to a meter in the MAP120 communication center.

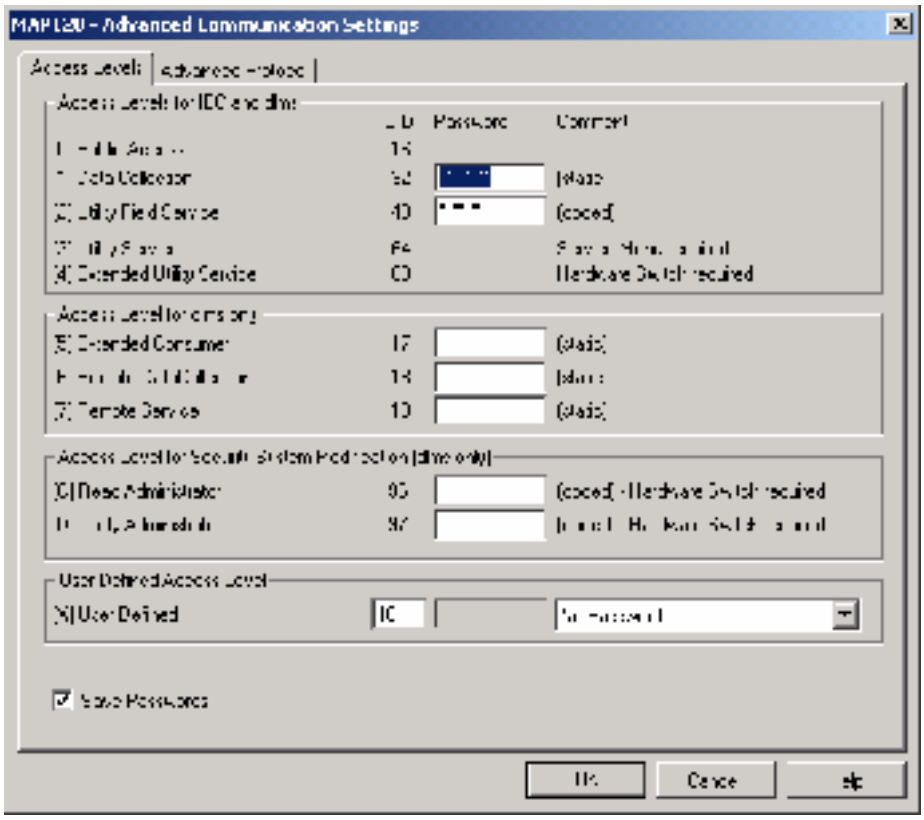
Selecting access level



The various access levels and their fields of application are fully described in chapter 11 "Description of Meter Security System".

Any passwords necessary can be changed in the "MAP120 - Advanced Communication Settings" window, which appears after clicking on **Advanced...**.

Settings for access levels



The following specified passwords are defined (not displayed):

- **00000000** as static password for access level 1
- **1234567** as coded password for access level 2

For the user-defined access level X the client type (UID) can also be determined. This is extremely useful for temporary use of another access level or for access to meters from other manufacturers using different client types.

5.1.5 Addressing Meters

For point-to-point connections the meter need not be specially addressed. But with multi-drop all meters connected to the bus system (RS485, CS or M-Bus) must have their own address for individual access. This address is called the **physical device address**. In fact even two physical device addresses are used, one for the IEC protocol (IEC device address) and the other for the DLMS protocol (HDLC device address).

Unless otherwise specified on the order, the following parameter values are set as defaults for these physical device addresses:

- Physical **IEC** device address = serial number (printed on face plate of meter), e.g. 73852799.
- Physical **HDLC** device address = last 4 digits of serial number plus 1000 (because with dlms the range of addresses is limited and some addresses are reserved), e.g. 3799 for a serial number 73852799 (2799 + 1000 = 3799).

© Landis+Gyr AG

The physical device addresses are stored as parameters of the basic meter and not in the communication unit. A change of communication unit does not therefore affect the addressing. These parameters can be found under "Identification numbers".

With the Landis+Gyr MAP120 Parameterization Tool the physical device addresses can be modified in the service tree under "Identification numbers".

5.2 Communication Examples

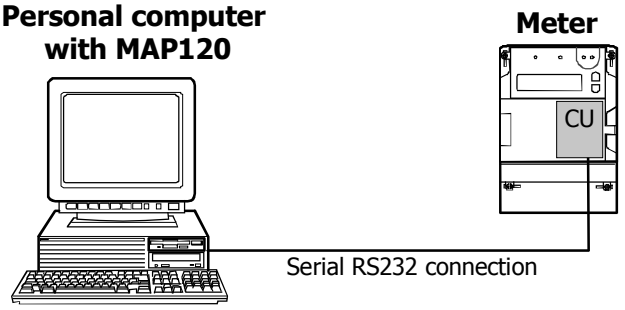
This chapter provides some examples to show how communication connections are made to meters via various communication paths and for various applications. It is assumed in all examples that the physical connections (e.g. cable or modem connections) have already been made and the Landis+Gyr MAP120 Parameterization Tool has already been started.

5.2.1 Local Point-to-Point Connection via Optical Reading Head

An example of a point-to-point connection to a single meter via an optical reading head is given in chapter 4 "First Steps".

5.2.2 Local Point-to-Point Connection via RS232 Interface

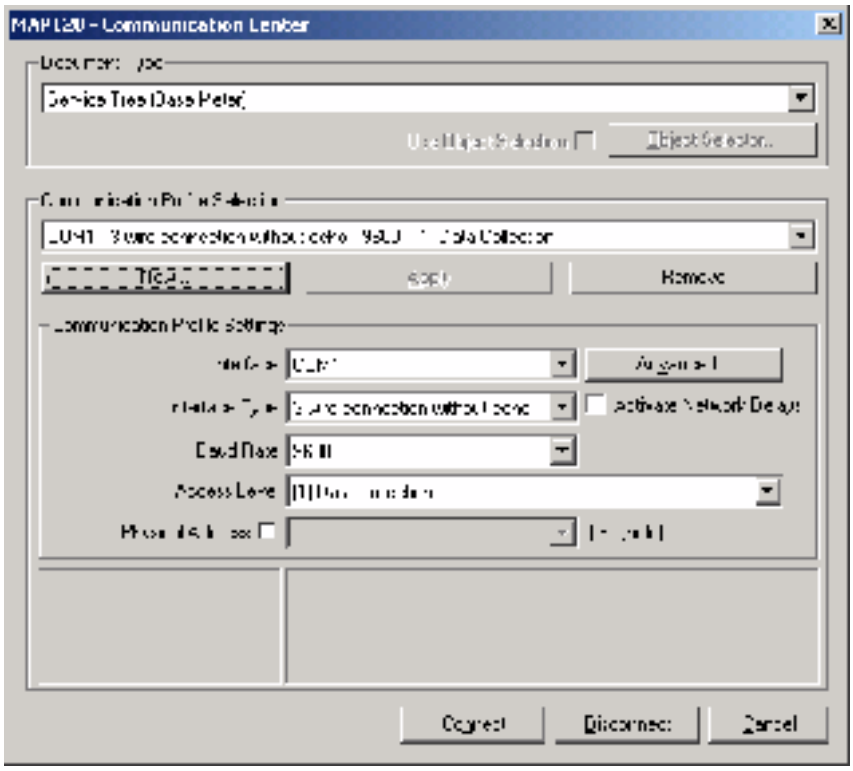
This example shows how a point-to-point connection is made to a single meter.



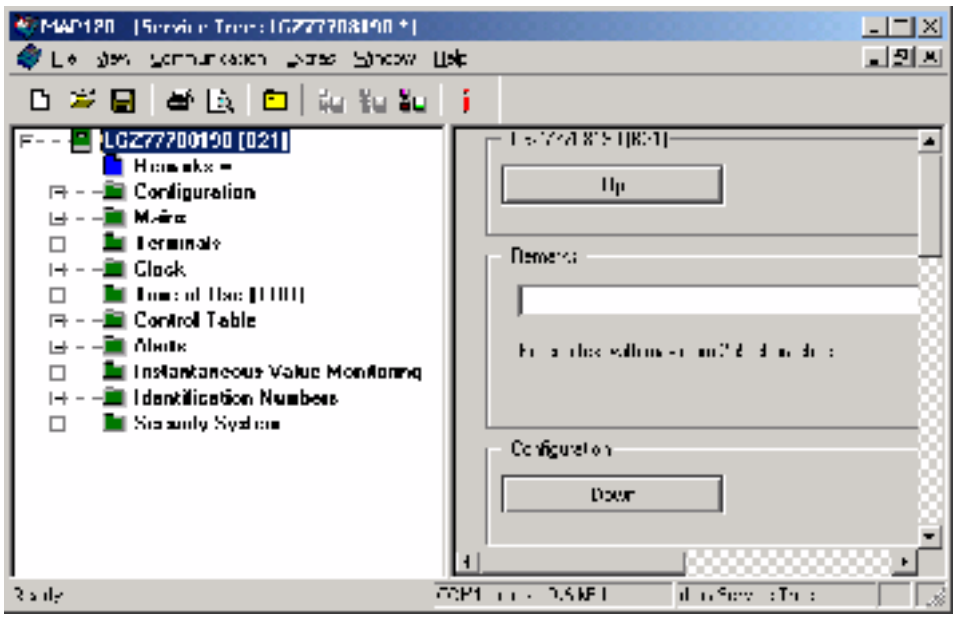
Procedure:

1. Click on in the toolbar or select **New** from the **File** menu.
   The "MAP120 - Communication Center" window appears showing the settings last used.
2. Select the desired document type in the selection box "Document Type" e.g. "Service Tree (Base Meter)".
3. Select or create a communication profile with the following settings (for procedure see chapter 5.1.2 "Communication Profiles"):
   - Selection box "Interface": serial interface, to which the connection cable to the RS232 interface of the meter is connected, e.g. COM1.
   - Selection box "Interface Type": 3-wire connection without echo.
   - Selection box "Baud Rate": Transmission rate according to the parameter settings of the communication unit in the meter, e.g. 9600.
   - Selection box "Access Level": required access level for the planned action, e.g. [1] Data Collection.

4. If it is only intended to use these settings temporarily and therefore are not saved as communication profile, click on **Apply**.



5. Click on **Connect**.
   The communication is started and the meter model is loaded from the connected meter. After termination of the readout the loaded meter model is displayed in the Landis+Gyr MAP120 Parameterization Tool.

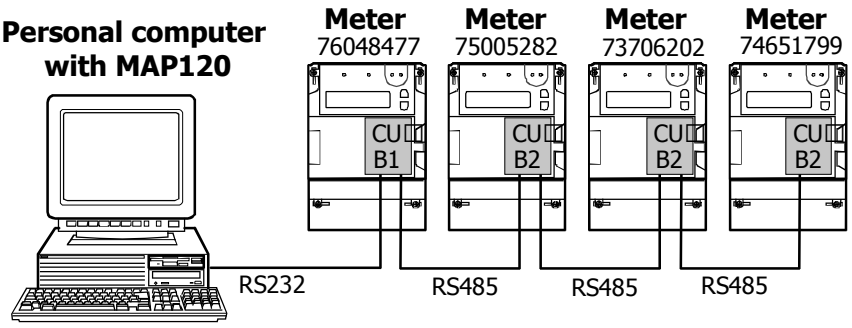


6. Carry out the intended actions.

© Landis+Gyr AG

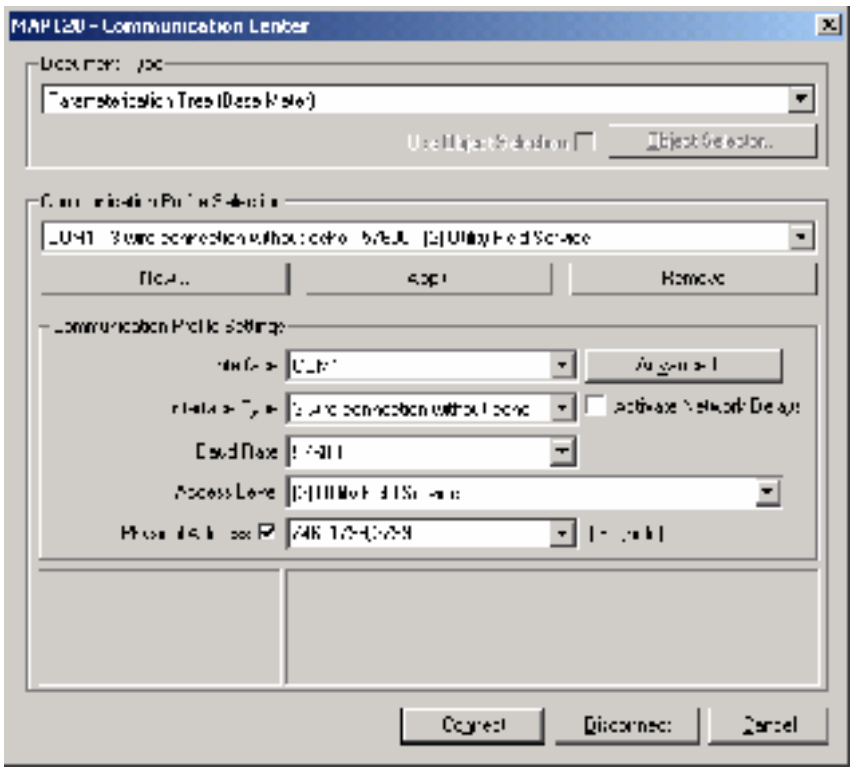
5.2.3 Local Multiple Connections via RS232/RS485 Interfaces

This example shows how a multiple connection is made to several meters mutually connected via RS485 interfaces. dlms is used as communication protocol. In the layout diagram below the meter numbers are given for addressing.

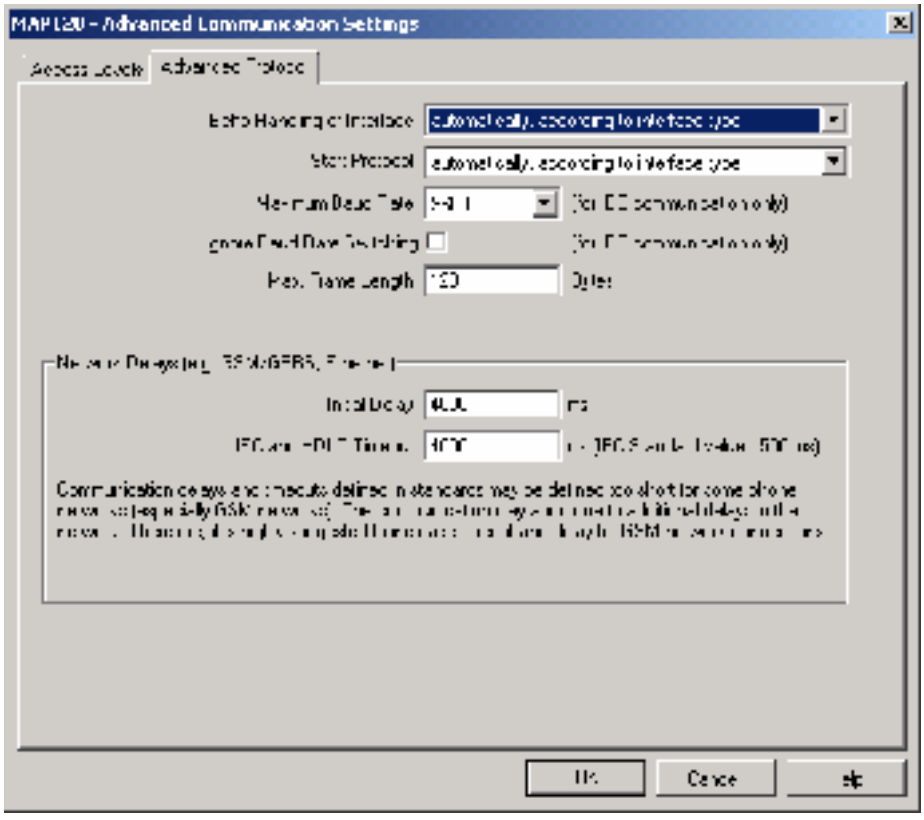


Procedure:

1. Click on in the toolbar or select **New** from the **File** menu.
   The "MAP120 - Communication Center" window appears showing the settings last used.
2. Select the desired document type in the selection box "Document Type" e.g. "Parameterisation Tree (Base Meter)".
3. Select or create a communication profile with the following settings (procedure see chapter 5.1.2 "Communication Profiles"):
   - Selection box "Interface": serial interface, to which the connection cable to the RS232 interface of the first meter (in this example no. 76048477) is connected, e.g. COM1.
   - Selection box "Interface Type": 3-wire connection without echo.
   - Selection box "Baud Rate": Transmission rate according to the parameter setting of the communication unit in the meter, e.g. 57600.
   - Selection box "Access Level": required access level for the planned action, e.g. [2] Utility Field Service.
4. Activate the "Physical Address" check box and enter the physical device addresses in the entry/selection box for the meter to be contacted or select them, if they have been entered already. Enter first the IEC device address and then separated by a semicolon the HDLC device address. The IEC device address corresponds to the meter serial number and the HDLC device address is calculated from the last 4 digits of the serial number plus 1000, e.g. 2799 for the meter with the serial number 74651799 (see also chapter 5.1.5 "Addressing Meters").



5. Click on **Advanced...**.
   The "MAP120 - Advanced Communication Settings" window appears.



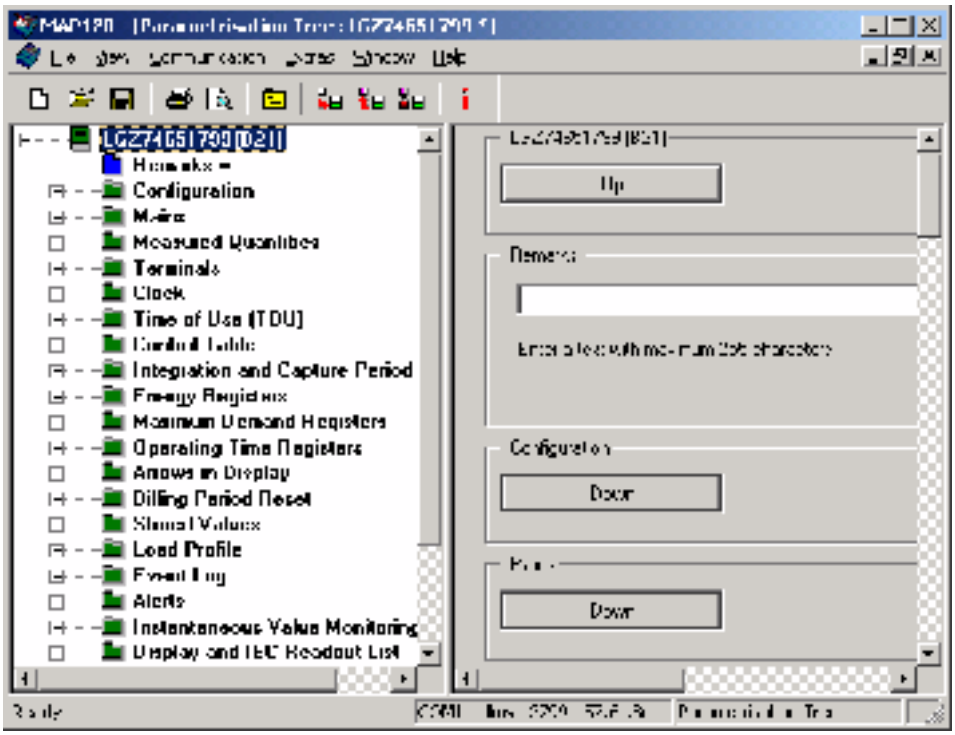
6. Ensure that either "HDLC" or "automatically, according to interface type" is set as start protocol.
   Since the dlms protocol is to be used and therefore the HDLC device address has been entered, "IEC" must not be set as start protocol.

7. Click on **OK**.
   The "MAP120 - Advanced Communication Settings" window disappears.

© Landis+Gyr AG

8. If it is only intended to use these settings temporarily and therefore are not saved as communication profile, click on **Apply**.

9. Click on **Connect**.
   The communication is started and the meter model is loaded from the connected meter. After termination of the readout the loaded meter model is displayed in the Landis+Gyr MAP120 Parameterization Tool.

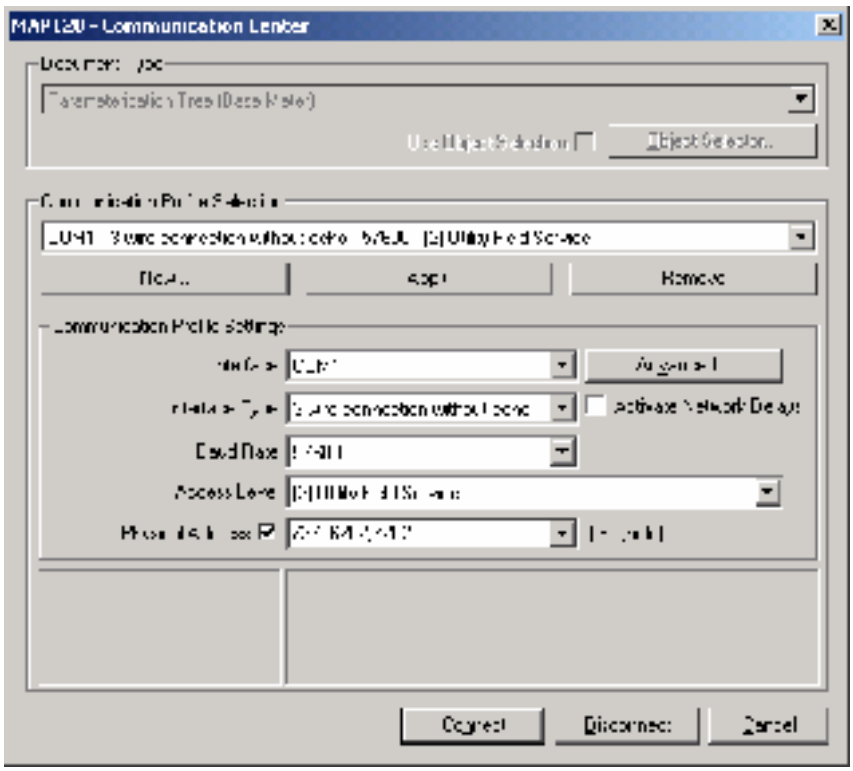


10. Perform the intended work.

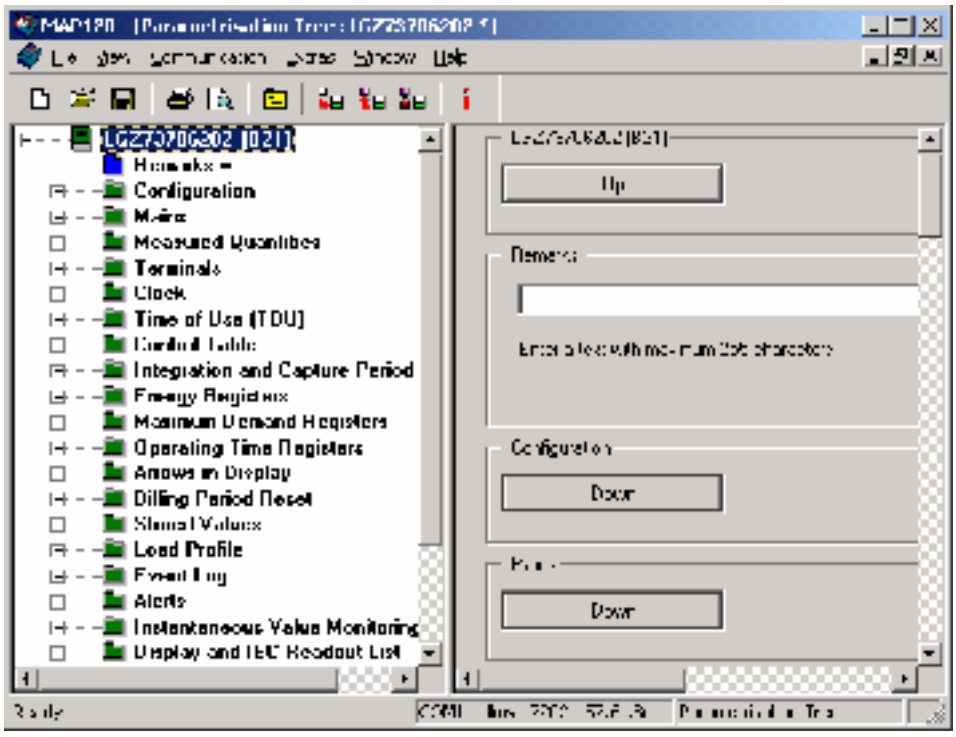
11. If you want to communicate with another meter of the multiple connection, select **Session Connector...** from the **Communication** menu.
    The "MAP120 - Communication Center" window appears.

12. Click on **Disconnect**.
    The connection is interrupted. Most boxes in the "MAP120 - Communication Center" are released.

13. In the entry/selection box "Physical Address" enter the physical device addresses of another meter of the multiple connection or select them, if they have been entered already. In this example "73706202;7202" for the meter 73706202.



14. Click on **Connect**.
    It can be seen in the status bar that a 57.6 kbd connection is made via the COM1 interface with the dlms protocol to meter address 7202.

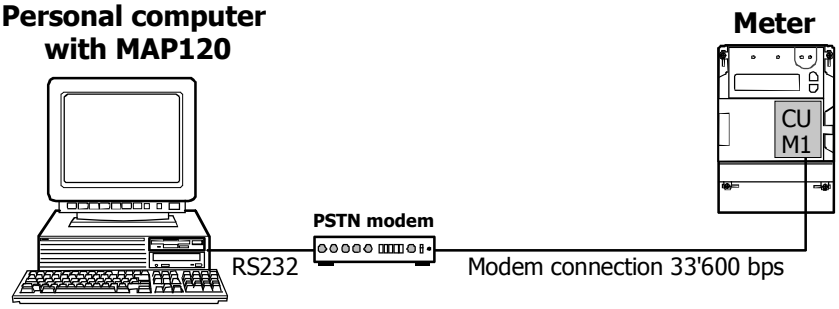


15. Also perform the required work for this meter.
16. Click on in the toolbar or select **Disconnect from Meter** from the **Communication** menu.
    The meter is disconnected (the status displayed in the status bar changes to "Disconnected").

© Landis+Gyr AG

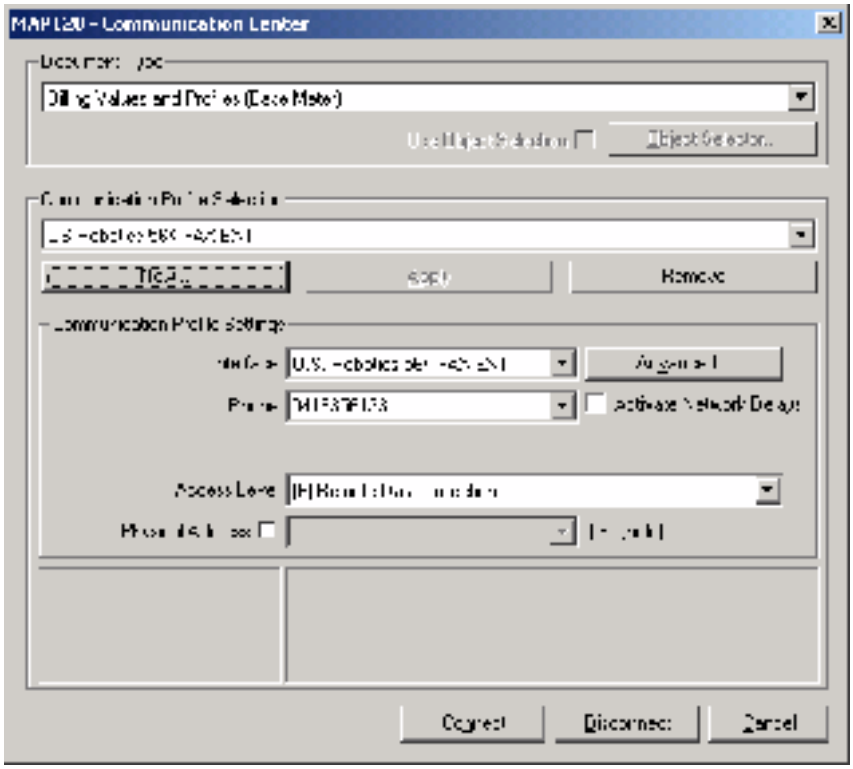
5.2.4 Remote Point-to-Point Connection via V34 PSTN Modem

This example shows how a point-to-point connection is made for remote communication with a single meter fitted with a CU-M1/V34 communication unit via a V34 PSTN modem. dlms is used as communication protocol.

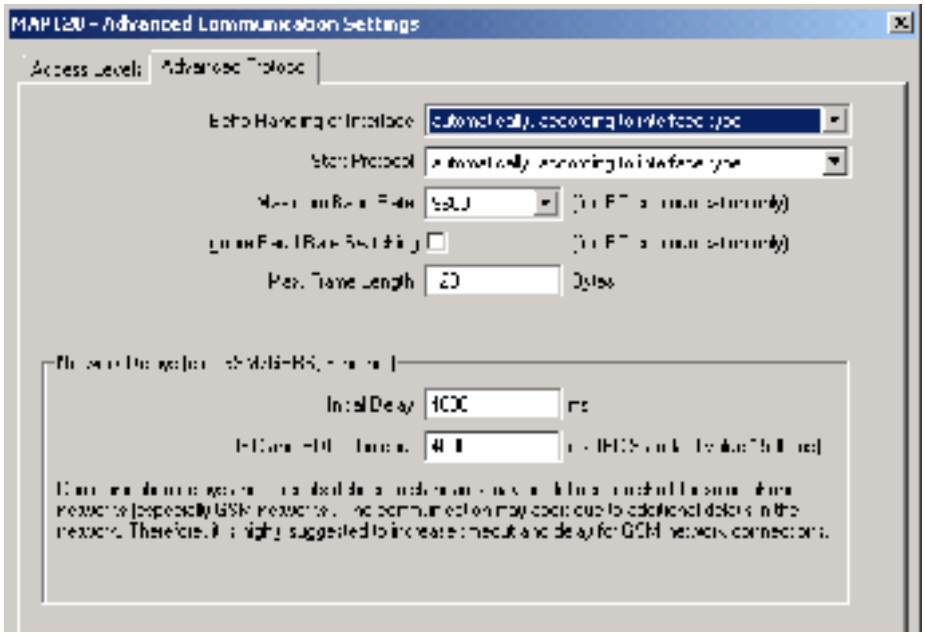


Procedure:

1. Click on in the toolbar or select **New** from the **File** menu.
   The "MAP120 - Communication Center" window appears showing the settings last used.
2. Select the desired document type in the selection box "Document Type" e.g. "Billing Values and Profiles (Base Meter)".
3. Select or create a communication profile with the following settings (procedure see chapter 5.1.2 "Communication Profiles"):
   - Selection box "Interface": any available V34 PSTN modem.
   - Entry box "Phone": telephone number of the remote modem.
   - Selection box "Access Level": required access level for the planned action, e.g. [6] Remote Data Collection.

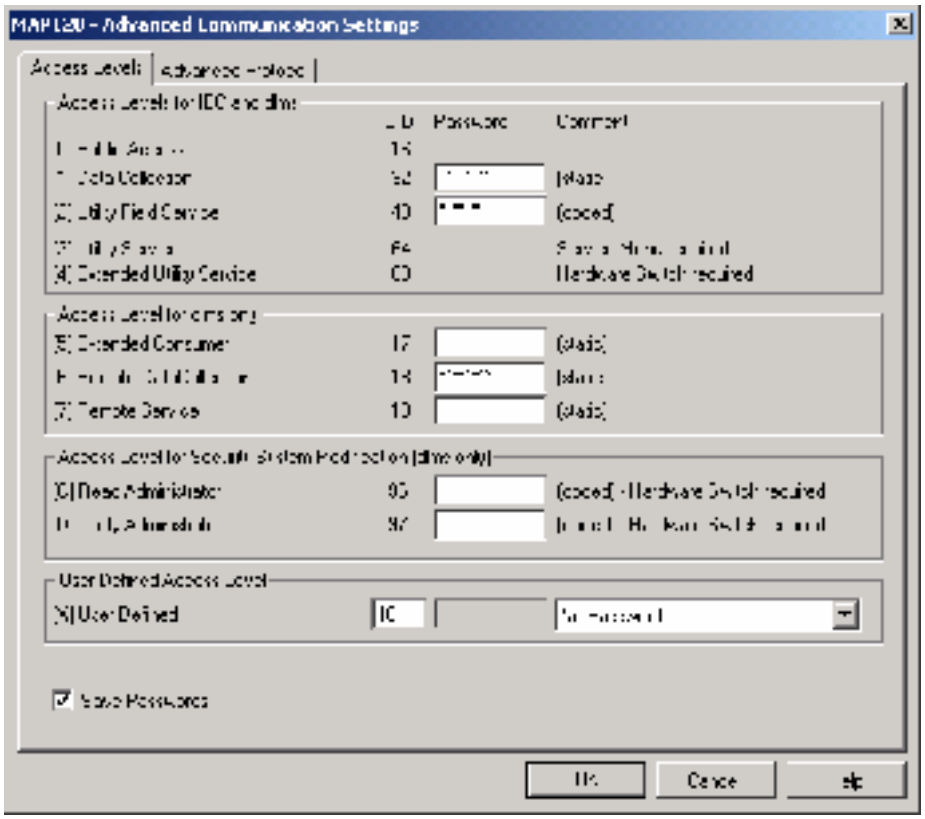


4. Click on **Advanced...**.
   The "MAP120 - Advanced Communication Settings" window appears.



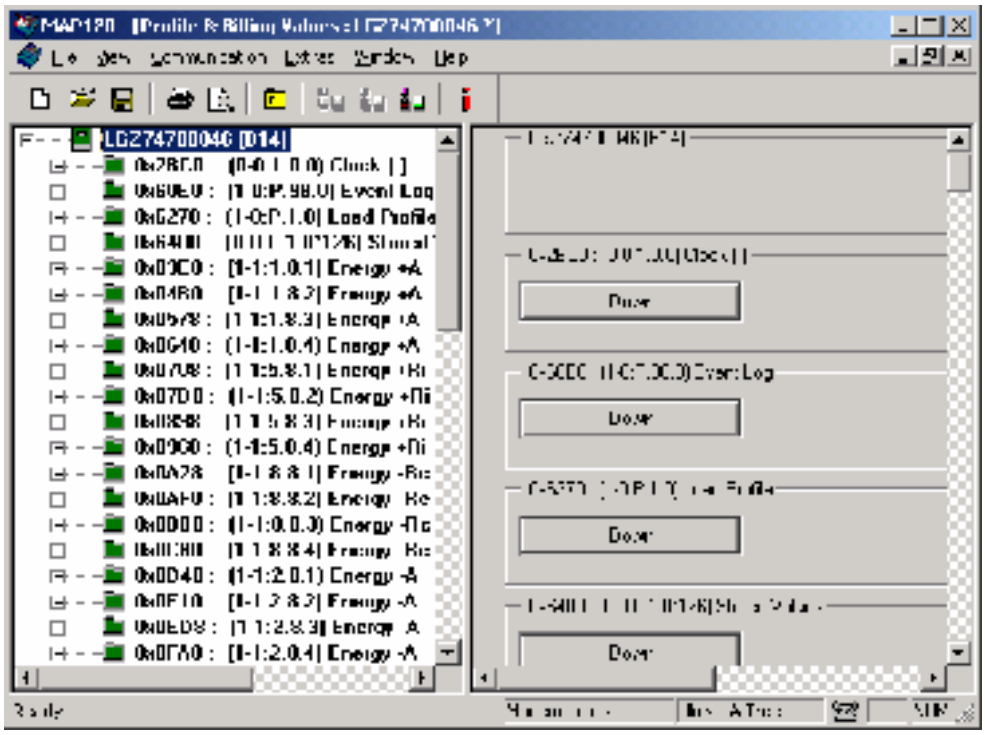
5. Ensure that either "HDLC" or "automatically, according to interface type" is set as start protocol.
   Since access is only possible via the dlms protocol for access level "[6] Remote Data Collection", "IEC" must not be set as start protocol.

6. Click on the tab "Access Levels" and enter the valid password for access level 6.
   For test installations at Landis+Gyr "66666666" is programmed as password for access level 6.



© Landis+Gyr AG

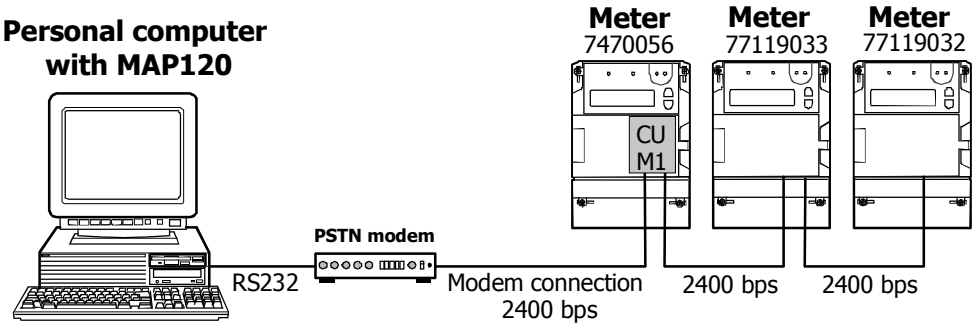
7. Click on **OK**.
   The "MAP120 - Advanced Communication Settings" window disappears.
8. If it is only intended to use these settings temporarily and therefore are not saved as communication profile, click on **Apply**.
9. Click on **Connect**.
   The communication is started and the meter model is loaded from the connected meter. After termination of the readout the loaded meter model is displayed in the Landis+Gyr MAP120 Parameterization Tool.



10. Perform the intended work.

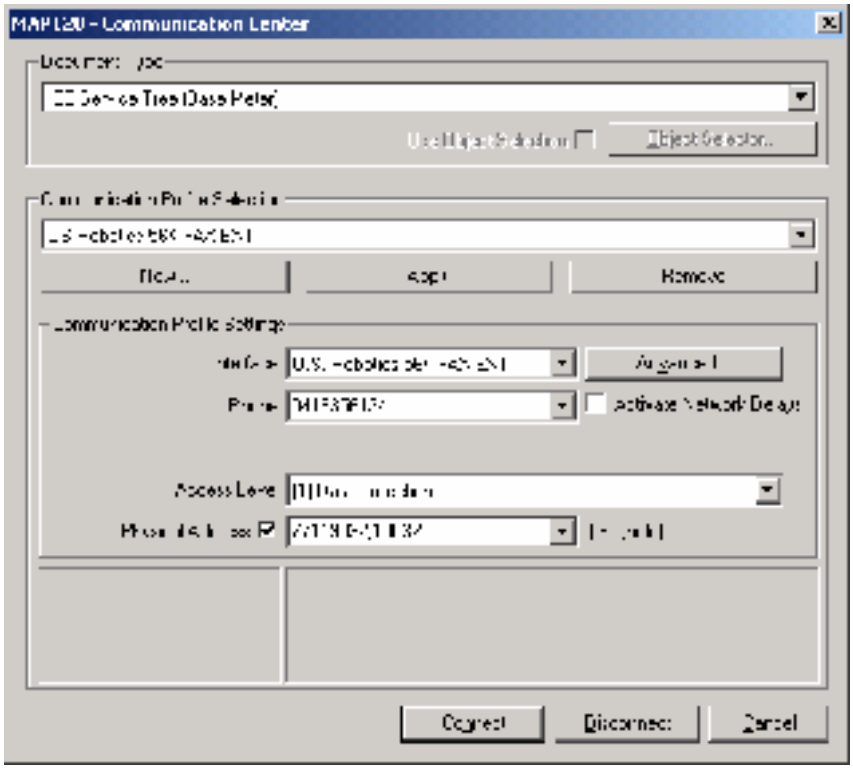
5.2.5 Remote Multiple Connection via V22bis PSTN Modem

This example shows how a multiple connection is made for remote reading of several interconnected meters via a V22bis PSTN modem. IEC is used as communication protocol. In the layout diagram below the meter numbers are given for addressing.



Procedure:

1. Click on in the toolbar or select **New** from the **File** menu.
   The "MAP120 - Communication Center" window appears showing the settings last used.
2. Select the desired document type in the selection box "Document Type" e.g. "IEC Service Tree (Base Meter)".
3. Select or create a communication profile with the following settings (procedure see chapter 5.1.2 "Communication Profiles"):
   - Selection box "Interface": any available V22bis PSTN modem.
   - Entry box "Phone": telephone number of the remote modem.
   - Selection box "Access Level": required access level for the planned action, e.g. [1] Data Collection.
4. Activate the "Physical Address" check box and enter the physical device addresses in the entry/selection box for the meter to be contacted or select them, if they have been entered already. Enter first the IEC device address and then separated by a semicolon the HDLC device address. The IEC device address corresponds to the meter serial number and the HDLC device address is calculated from the last 4 digits of the serial number plus 1000, e.g. 10032 for the meter with the serial number 77119032 (see also chapter 5.1.5 "Addressing Meters").

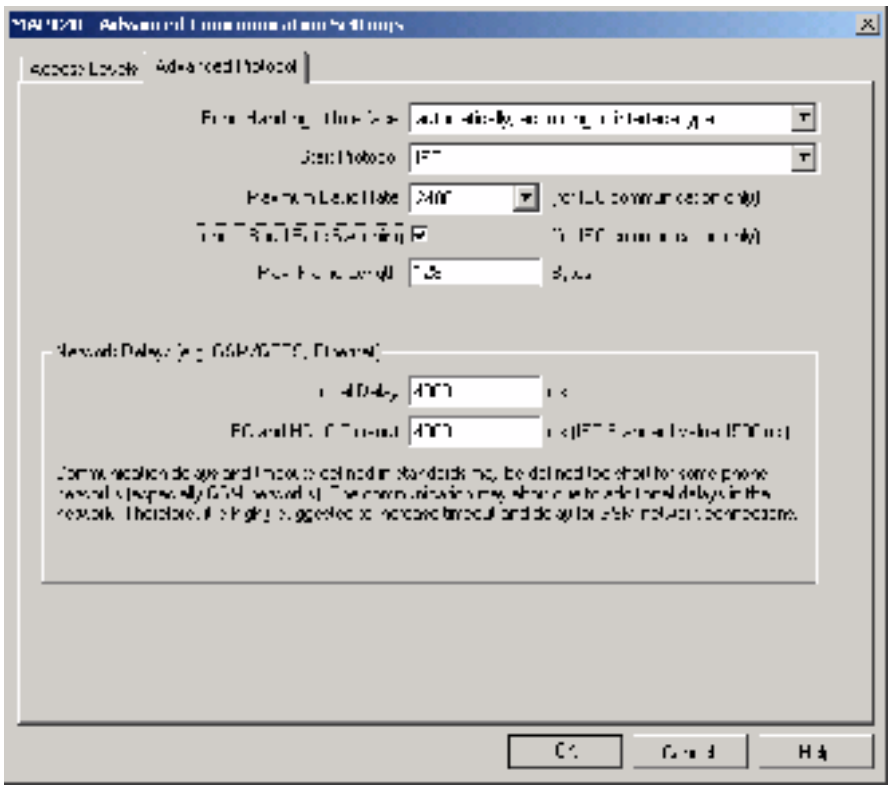


5. Click on **Advanced...**.
   The "MAP120 - Advanced Communication Settings" window appears.
6. Select the item "IEC" in the "Start Protocol" box.
   This is necessary because the IEC protocol is to be used and therefore the IEC device address has been entered.

© Landis+Gyr AG

7. Select the item "2400" in the "Maximum Baud Rate" box.
   This is necessary because a V22bis modem is used on the meter side and the multiple connection is also set to 2400 bps.

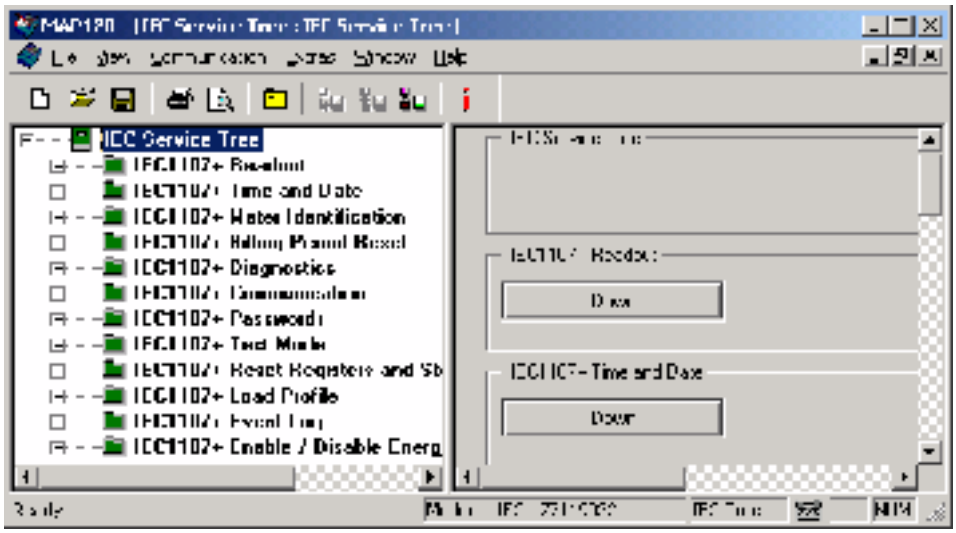
8. Activate the check box "Ignore Baud Rate Switching".



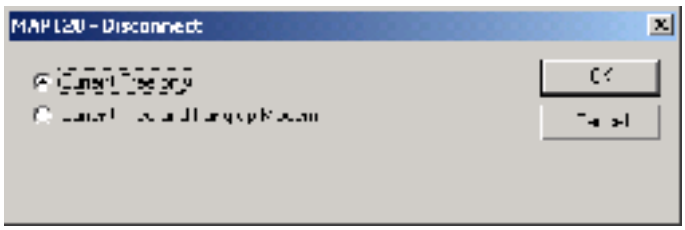
9. Click on **OK**.
   The "MAP120 - Advanced Communication Settings" window disappears.

10. If it is only intended to use these settings temporarily and therefore are not saved as communication profile, click on **Apply**.

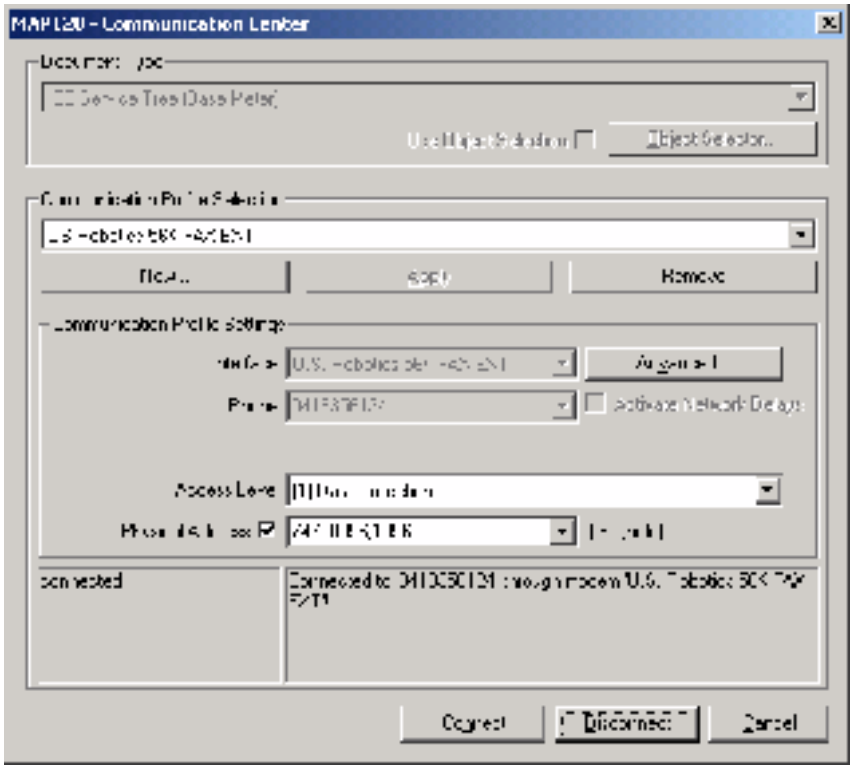
11. Click on **Connect**.
    The modem connection is made and the IEC service tree is loaded for execution of formatted commands. A description of all formatted commands is given in chapter 12 "Formatted Commands According to IEC 62056-21". It can be seen in the status bar that a modem connection is made to the meter 77119032 with the IEC protocol.



12. Perform the intended work.
13. If you want to communicate with another meter of the multiple connection, select **Session Connector...** from the **Communication** menu.
    The "MAP120 - Communication Center" window appears.
14. Click on **Disconnect**.
    The "MAP120 - Disconnect" window appears.
15. Select the option box "Current Tree only".
    The modem connection is therefore retained and the data can then be read from another meter in the multiple connection.



16. Click on **OK**.
    Specific fields in the "MAP120 - Communication Center" window are released.
17. In the entry/selection box "Physical Address" enter the physical device addresses of another meter of the multiple connection or select them, if they have been entered already. In this example "74700056;1056" for the meter 74700056.



18. Click on **Connect**.
    It is seen in the status bar that a modem connection is made to the meter 74700056 with the IEC protocol.
19. Also perform the required work for this meter.

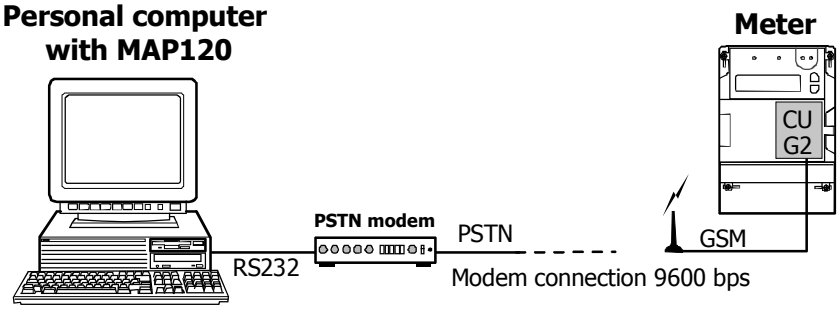
© Landis+Gyr AG

20. Click on in the toolbar or select **Disconnect from Meter** from the **Communication** menu.
    An inquiry appears for interruption of the connection.

21. Click on **OK**.
    The modem connection to the meter is interrupted. The status displayed in the status bar changes to "Disconnected".

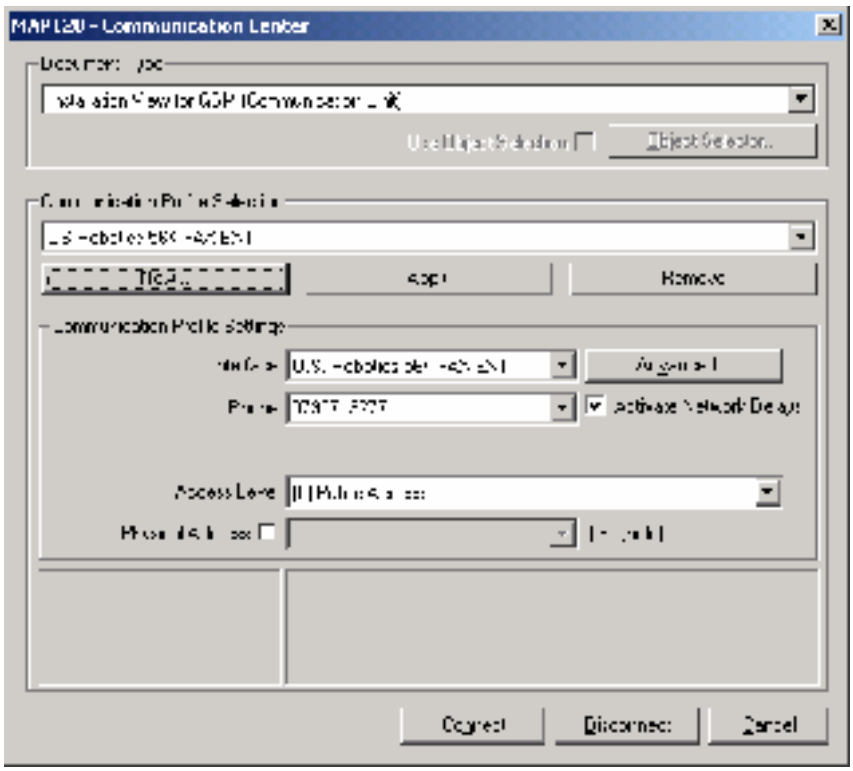
5.2.6 Remote Point-to-Point Connection via GSM Modem

This example shows how a modem point-to-point connection is made to a meter with GSM modem (CU-G2 communication unit) in order, for example, to check the existing field strength at the meter.

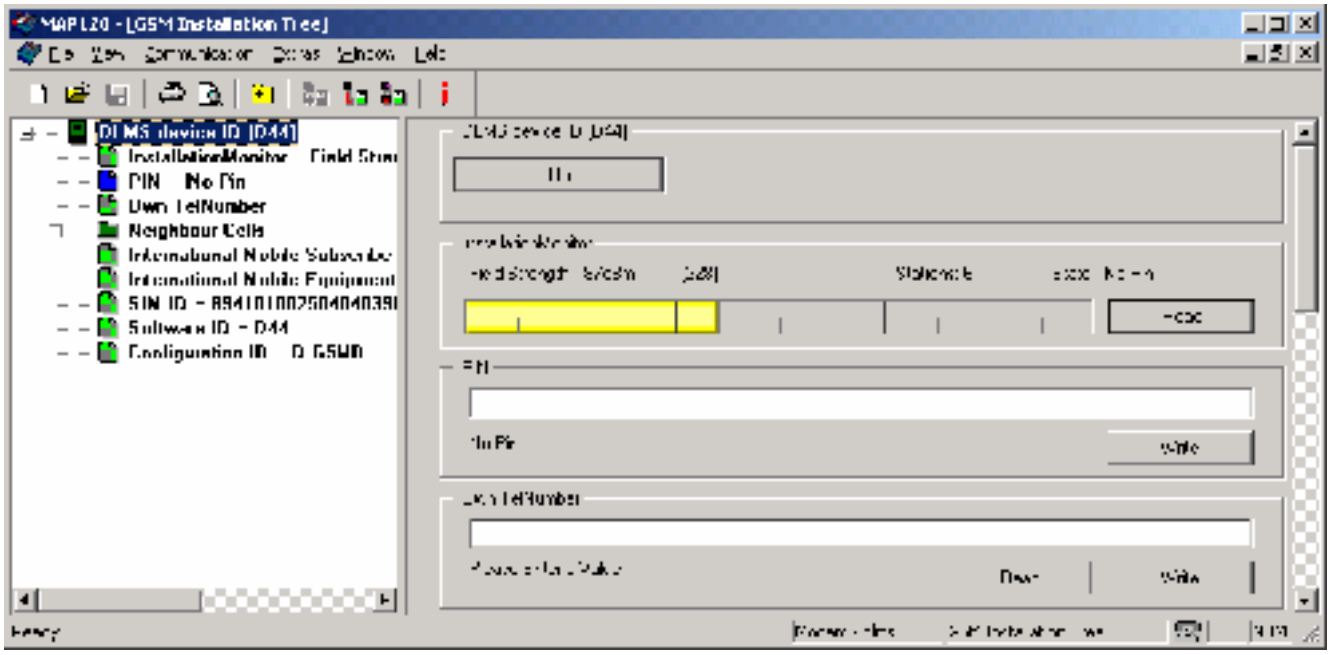


Procedure:

1. Click on in the toolbar or select **New** from the **File** menu.
   The "MAP120 - Communication Center" window appears showing the last used settings.
2. Select the "Installation View for GSM (Communication Unit)" entry in the "Document Type" box.
3. Select or create a communication profile with the following settings (procedure see chapter 5.1.2 "Communication Profiles"):
   - Selection box "Interface": any available modem.
   - Entry box "Phone": telephone number of the remote GSM modem.
   - Selection box "Access Level": required access level for the planned action, e.g. [0] Public Access.
4. Activate the check box "Activate Network Delays".
   This increases the time delays with respect to the standard value of 1500 ms to the value set under "Advanced Communication Settings" (default value = 4000 ms). Increasing the time delays prevents the occurrence of interruptions during data transmission and is urgently recommended for GSM networks.
5. If it is only intended to use these settings temporarily and therefore are not saved as communication profile, click on **Apply**.

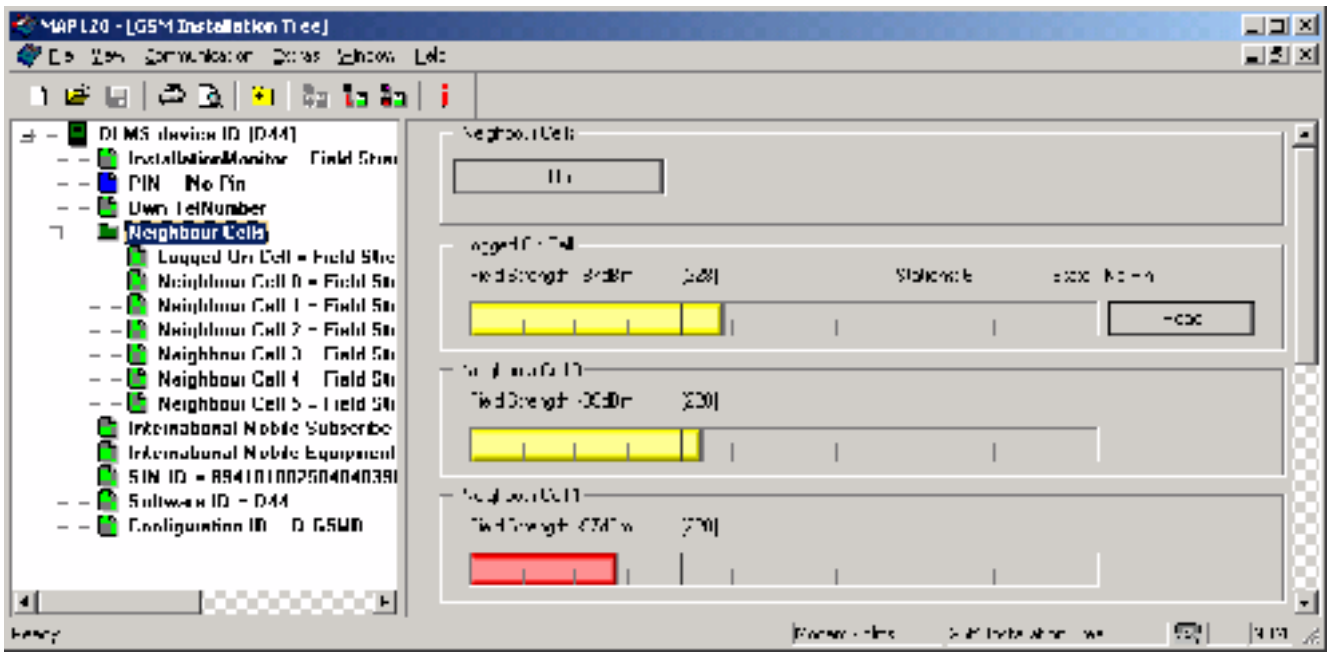


6. Click on **Connect**.
   The modem connection is made and the GSM installation tree loaded from the communication unit of the meter called up. The field strength at the location of the meter is displayed as a bar and as a value.



7. Click, for example, on "Neighbour Cells" in the GSM installation tree to display also the field strengths of the neighbour cells.

© Landis+Gyr AG



8. Click on in the toolbar or select **Disconnect from Meter** from the **Communication** menu.
   An inquiry appears for interruption of the connection.

9. Click on **OK**.
   The modem connection to the meter is interrupted. The status displayed in the status bar changes to "Disconnected".

5.3 Reference to Other Documents

Detailed information about Landis+Gyr Dialog communication solutions can be found in the following documents.

- **Data sheets** for the various communication units
- **User manuals** for the various communication units
- **Basic information** for communication applications
- Detailed **application notes** for numerous reference applications with various communication units for different transmission media

All these documents as well as advisory services are available from the competent representative of Landis+Gyr.

6 Description of Types of Tree

This chapter describes all the types of tree available in the Landis+Gyr MAP120 Parameterization Tool for the representation of device descriptions.

6.1 Survey

Various types of tree can be represented in the Landis+Gyr MAP120 Parameterization Tool in the left-hand half of device description windows. Certain types of tree permit a view of values, while others allow a view of parameters. Various types of tree are available depending on the license.

Types of tree

The following table shows all types of tree, their purpose of use and the minimum type of license necessary to ensure availability of the relevant type of tree. Unless specified otherwise, the types of tree are available both for base meters and also communication units.

Type of tree	Purpose of use	Necessary license
dlms Tree	Reading register values and profiles	Service Edition
Tree for Billing Values and Profiles (only available for base meter)	Reading billing values and profiles	Service Edition
Service Tree	Test, certification, installation and service, e.g. adapting primary data, re-parameterise time switch, setting date/time, setting identification number, setting password	Service Edition
IEC Service Tree	Execution of IEC commands	Service Edition
Parameterisation Tree (only available for base meter)	Device programming, synchronisation	Professional Edition
Installation Tree for GSM Communication Units	Installation of communication units with GSM modem	Service Remote Edition

Tree representation

A tree representation, e.g. as generally familiar from the file system tree of Windows Explorer, is ideally suited for clear presentation of ordered structures (e.g. of files placed in folders and sub-folders).

Tree items

For the Landis+Gyr MAP120 Parameterization Tool every tree consists of a hierarchic arrangement of tree items (folders, parameters, values or commands).

Tree items are represented as follows:

Root folder

Folder

Parameter, value or command

Modified parameter or value (with asterisk)

© Landis+Gyr AG

Read-only parameter or value

Service function

Various statuses of parameters or values are indicated with different colours of tree items.

Folder handling

Each folder can be expanded and collapsed individually. If the tree is fully collapsed, only the root folder remains visible, which for example represents the entire meter (all parameters or values) or with the IEC service tree the entire range of commands (all IEC commands).

Collapsed folder items are preceded by an expansion sign ⊞, expanded folder items by a collapse sign ⊟.

To expand or collapse folders there are the following possibilities:

Using the mouse:

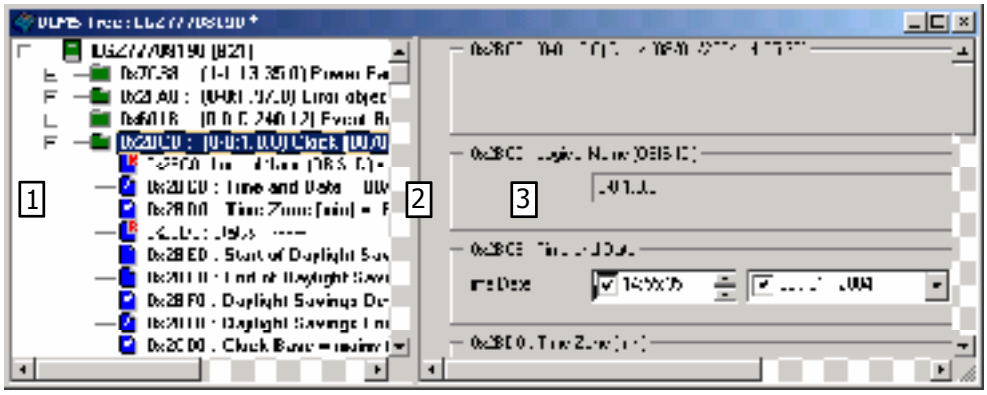
- Clicking on the expansion sign ⊞ of a folder expands this folder (the expansion sign changes to a collapse sign ⊟).
- Clicking on the collapse sign ⊟ of a folder collapses this folder (the collapse sign changes to an expansion sign ⊞).

Using the keyboard:

- Pressing the **"*" key** of the numerical keyboard expands the whole tree below the selected folder (i.e. all subfolders and parameters will be visible).
- Pressing the **"/" key** of the numerical keyboard collapses the whole tree below the selected folder (i.e. all subfolders and parameters will no longer be visible).
- Pressing the **"+" or "-" key** of the numerical keyboard toggles between the expanded and collapsed tree representation.

Device description windows

Device description windows, for example, show a register or parameter representation of a meter type or a summary of executable commands depending on the type of tree.



1 Left-hand half of window with tree representation of device description

2 Movable separating bar

3 Right-hand half of window with detailed view of selected tree items

The windows are divided into two by a movable separating bar (moved by clicking and shifting the bar). The left-hand half of the window contains a general tree representation, while on the right are displayed details of the current tree item marked (value, parameter or folder).

The active window half can be changed by pressing [F6] or by clicking in the other window half. This does not change the focus and marking in the newly activated window half. In the basic condition the first tree item is selected in the left-hand half and the first element for modification or the first button in the right-hand half. Both sectors of the window have horizontal and/or vertical picture scrolling functions if part of the window half cannot be seen. Scrolling does not affect either the focus or the current marking.

6.2 dlms Tree

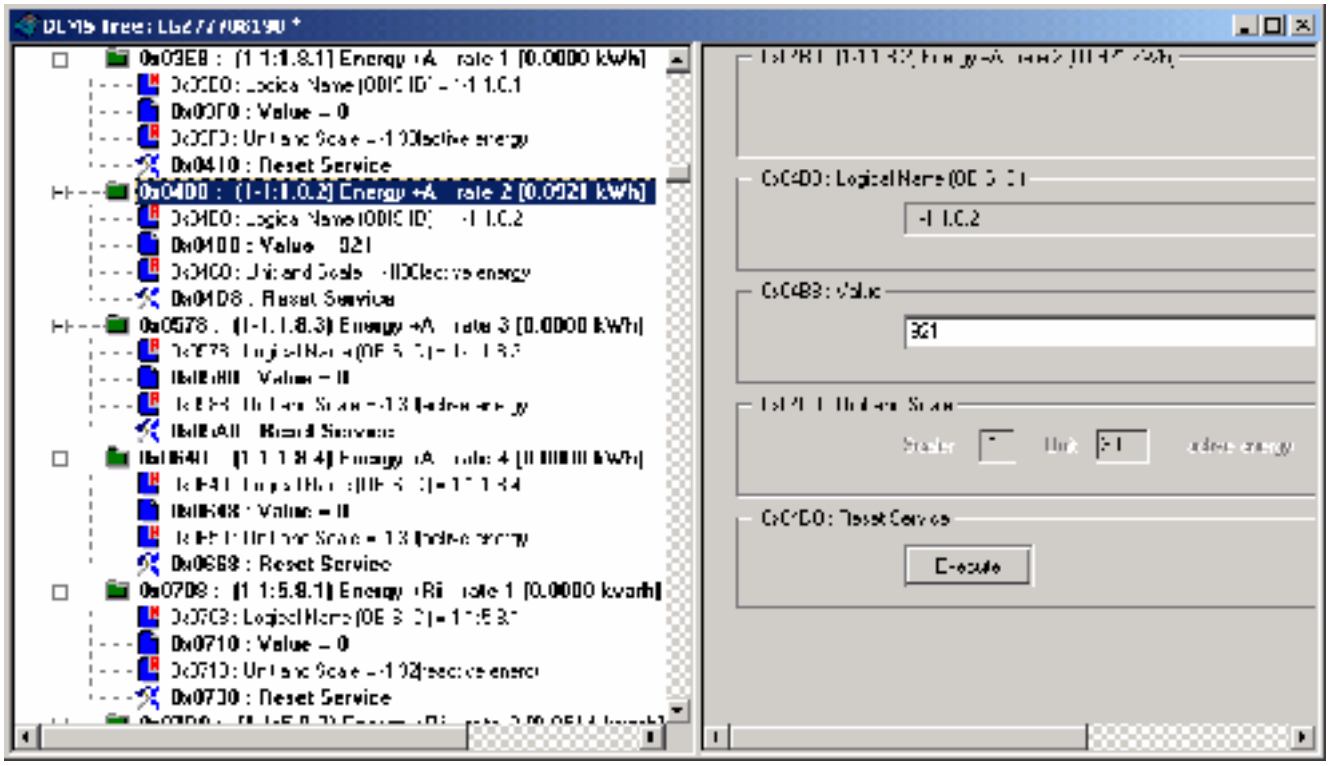
The dlms tree displays register values, but no parameters. After calling up, the values are **not** read automatically from the device, but only an index of all dlms meter items. The values of interest can then be read from the meter individually.

The dlms tree is available in two different views: as normal view and as Landis+Gyr view.

Normal view

The normal view only shows items and attributes described in dlms standard 62056-22 (dlms = Device Language Message Specification). It should function with all dlms meters.

Representation example:


0x0400 : (1-1:1.0.2) Energy +A rate 2 [0.0021 kWh]
0x0410 : Reset Service
0x0578 : (1-1:1.8.3) Energy +A rate 3 [0.0000 kWh]
0x0708 : (1-1:5.8.1) Energy +R rate 1 [0.0000 kvarh]
0x0710 : Value = 0
0x0730 : Reset Service
0x0400: Logical Name (OBIS ID) = 1-1:1.0.2
Execute

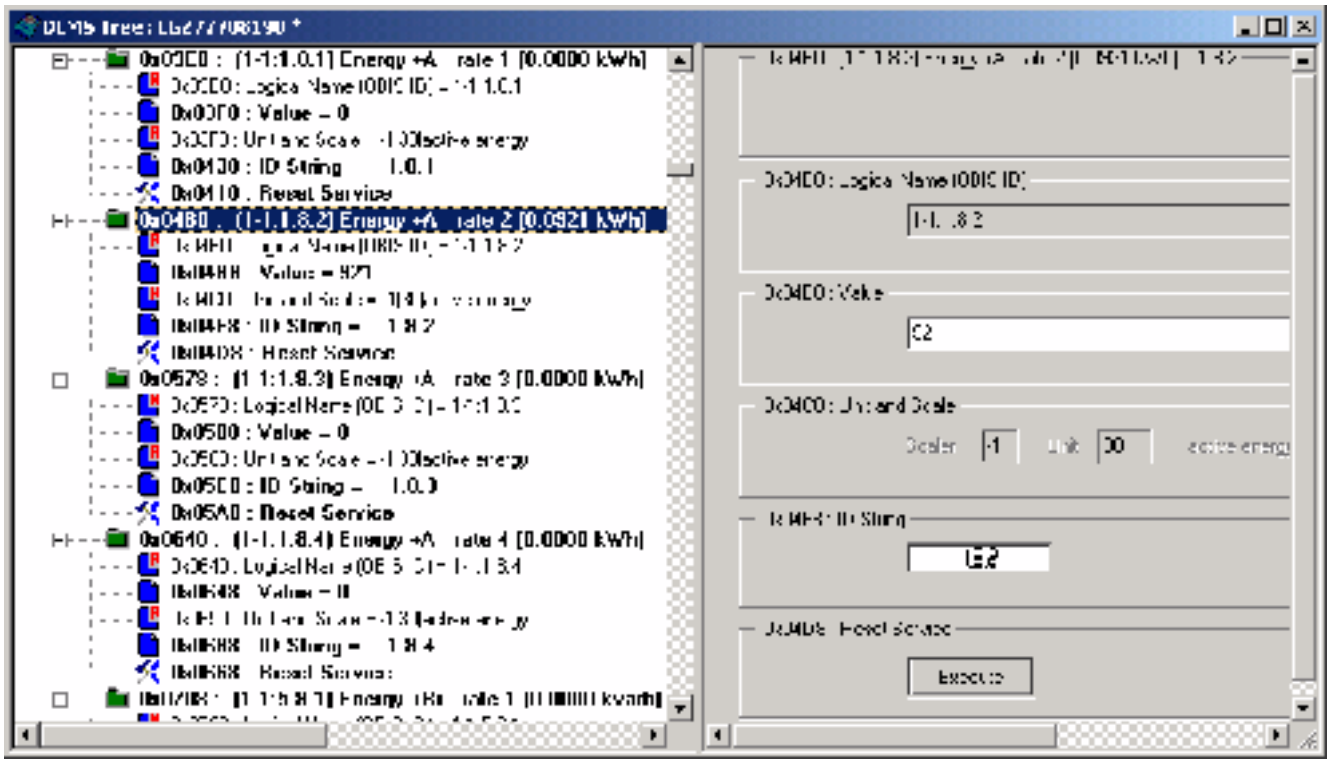
© Landis+Gyr AG

Landis+Gyr view

The Landis+Gyr view shows more detail than the normal view, e.g. additional information about the meter, such as the additional attribute "ID String" (code represented in the display, e.g. 1.8.2).

Since interpretation of the additional information displayed is dependent on the manufacturer, this setting only functions with Landis+Gyr meters. For use of the Landis+Gyr view the "Show Landis+Gyr Association View" check box must be activated in the option settings.

The following example shows the same tree section as before, but in the Landis+Gyr view:



OBIS identification

The general structure of the logical name (OBIS identification) displayed in both views of the dlms tree is described in chapter 13 "OBIS Identification Codes".

Example: The OBIS identification **1-1:1.8.2** has the following significance:

1-1:1.8.2 A: Medium: Electricity

1-**1**:1.8.2 B: Measuring channel: Base meter

1-1:**1**.8.2 C: Measured quantity: Active energy import

1-1:1.**8**.2 D: Type of measurement: Cumulative maximum

1-1:1.8.**2** E: Tariff 2

Summary of folder level

A summary of the folder contents is always displayed in both views of the dlms tree at the folder level, e.g.:

- Energy register:
  (1-1:1.8.2) Energy +A rate 2 [0.0921 kWh]
  (OBIS identification) active energy import tariff 2 [register value]

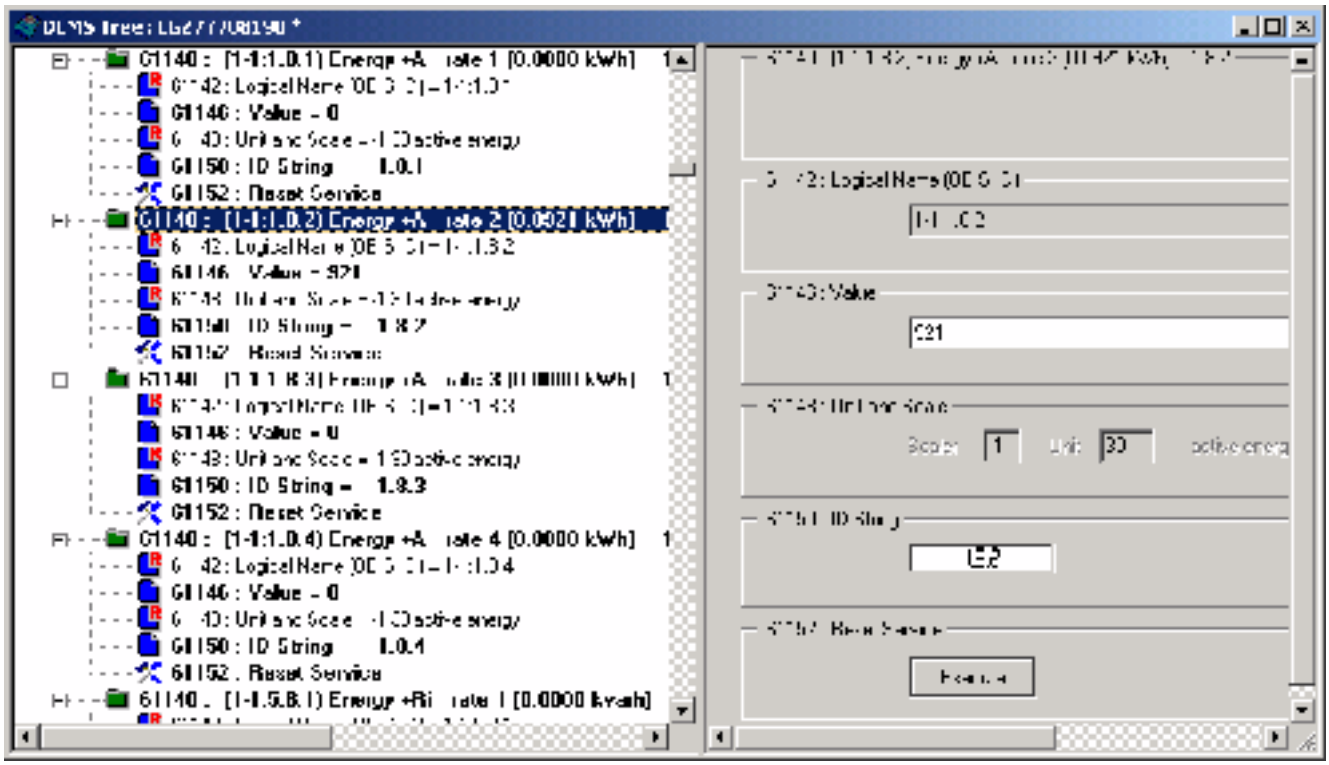
- Demand register:
  (1-1:1.4.0) Current Average Demand +A [3.5679 kW]
  (OBIS identification) current average demand active energy import [register value]
- Maximum demand register:
  (1-1:5.6.1) Maximum +Ri [0.4326 kvar]
  (OBIS identification) demand maximum reactive energy import [register value]
- Calendar clock:
  (0-0:1.0.0) Clock [24/11/2003 11:26:47]
  (OBIS identification) clock [date and time]
- Identification number:
  (1-0:0.0.0) Identification Number 1.1 [12345678]
  (OBIS identification) identification number 1.1 [number]

Representation settings

Further representation features for the dlms tree can be provided in addition to the view in the option settings of the MAP120 (see also chapter 8.3.2 "Specifying General Tool Settings"):

- Optional display of identification number (five digit number, e.g. 61140 for energy registers)
- Optional display of short name (hexadecimal dlms address, e.g. 0x04B0)

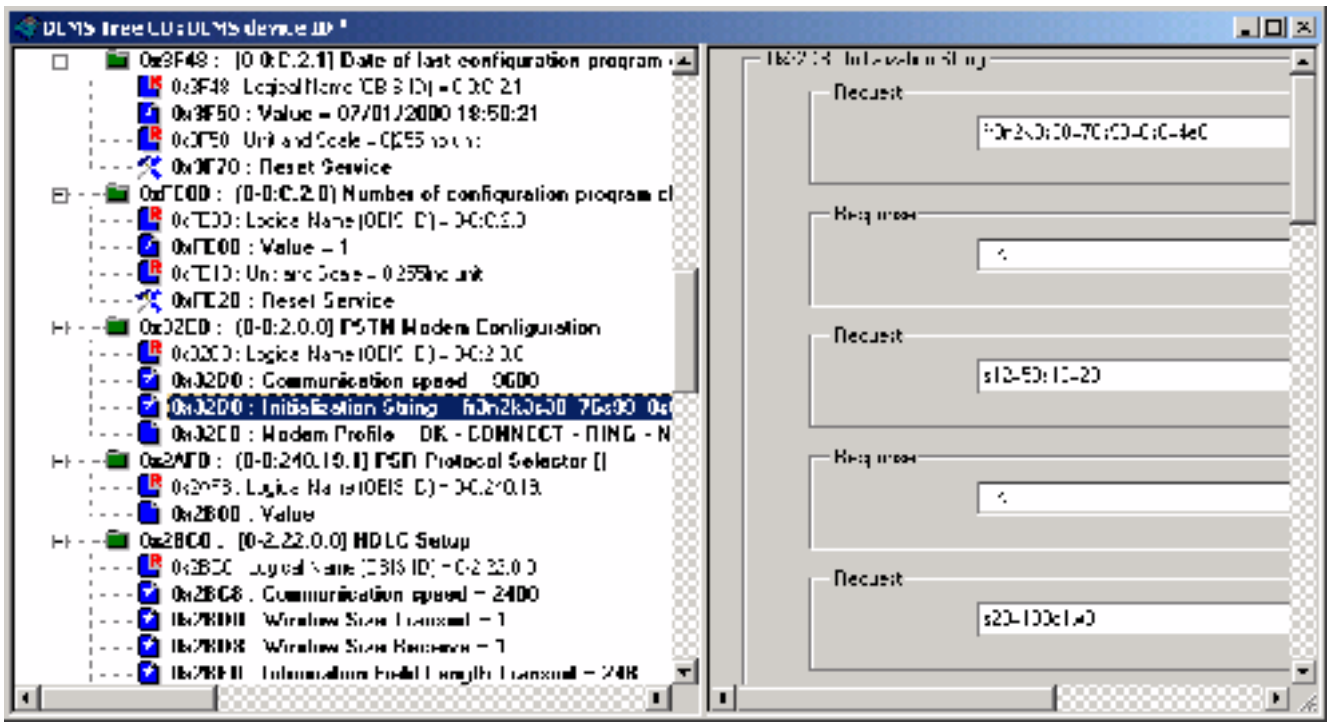
Example with identification numbers switched on and short names switched off:



dlms trees can be called up either for the base meter or for a communication unit fitted in the meter.

The following example shows a section of a dlms tree for a communication unit.

© Landis+Gyr AG



Selecting data

Individual elements or groups of several elements for reading meters or transmitting to the meters can be selected in the dlms tree. Selection is made hierarchically in principle, i.e. all subordinate elements, e.g. the contents of selected folders, are also selected automatically (with the sole exception of memories for events, load profiles and stored values). To select several elements these must be marked, while it is sufficient to click on individual elements.

Transmitting individual tree item

The transmission of selected tree items to or from the meter can be started either in the **Communication** menu or in the pop-up menu (called up with right mouse button) with **Load Current Selected Items from Meter** or **Send Current Selected Items to Meter.**

Marking and transmitting several tree items

Select the entry **Mark for Exchange** for each of the tree items to be marked after clicking either in the **Communication** menu or in the pop-up menu (called up with right mouse button). Alternatively the key combination [Ctrl]+[M] can also be used for marking. Marked elements and all higher-order folders are marked in the tree with blue arrows. Transmission to or from the meter can then either be started in the **Communication** menu or in the pop-up menu (called up with right mouse button) with **Load Marked Items from Meter** or **Send Marked Items to Meter.**

Removing markings again

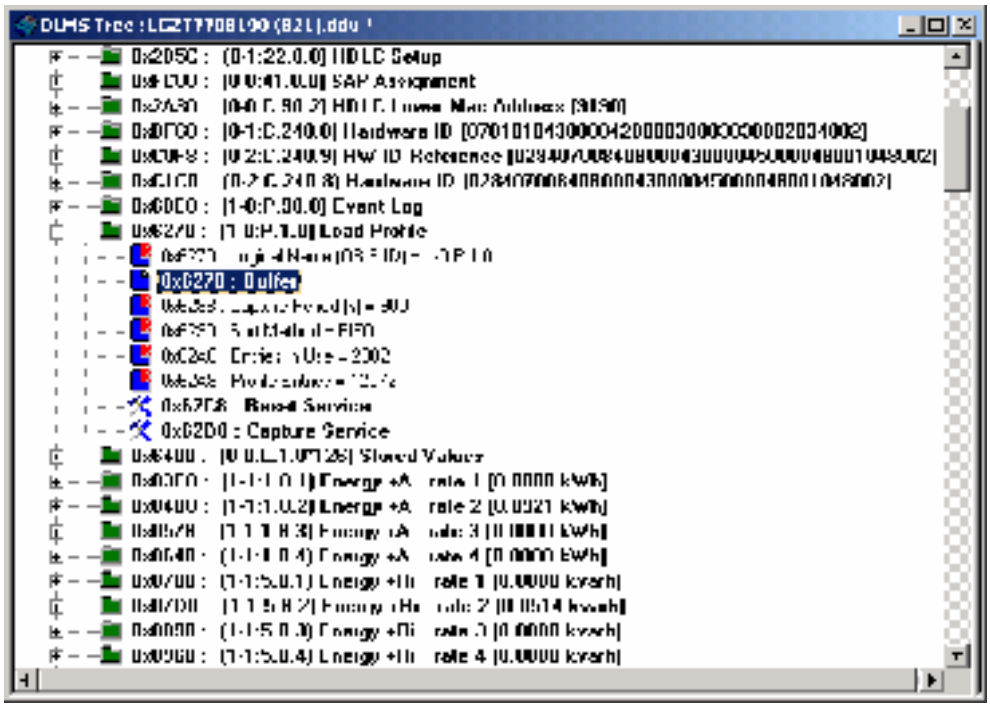
Markings can be deleted again individually or collectively either in the **Communication** menu or in the pop-up menu (called up with right mouse button) with **Unmark Item** or **Unmark All**.

Saving markings

Markings can be saved with the device description ("Save" or "Save as" function) for repeated use for data transmissions.

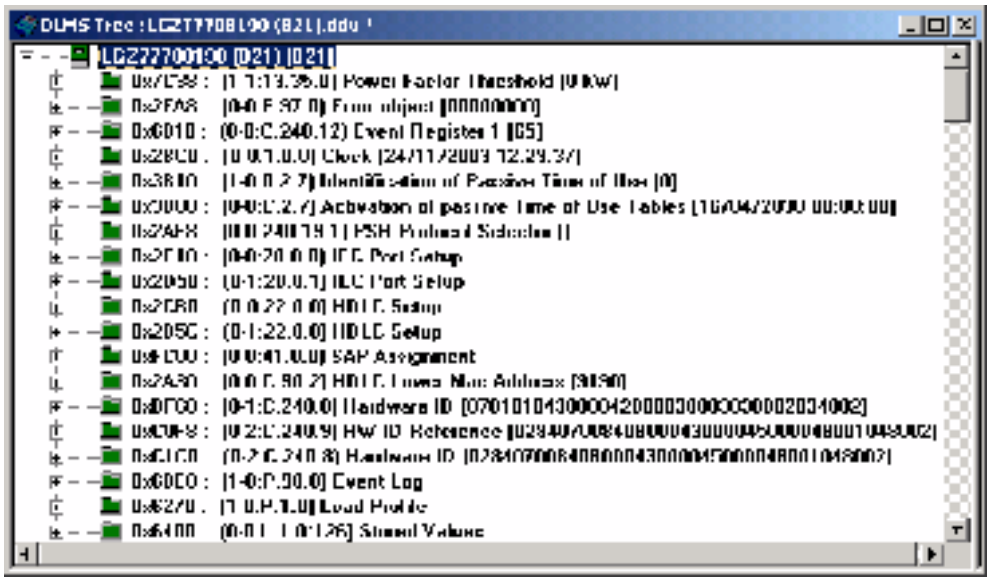
Readout of profiles

When using the dlms tree to read out profiles, the buffer must be selected according to the diagram below, otherwise the profile will not be read out. If any higher-order element is selected (e.g. the "Load Profile" folder) the memory is not read out. This applies to all three profile memories (stored values, load profile and event log).



Reading out all values with one command

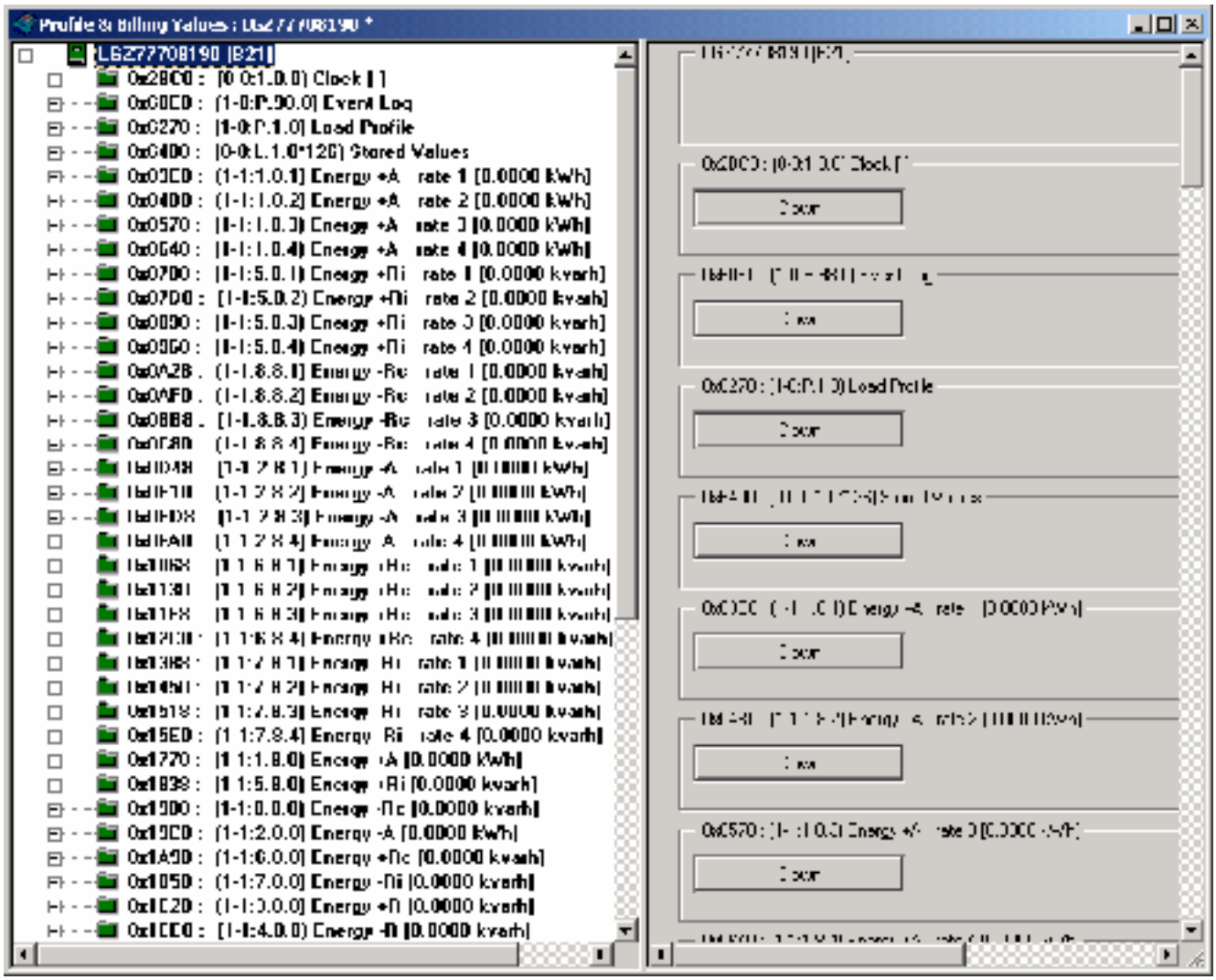
It is possible instead to read out all values of the dlms tree with **one** command by selecting the meter at the highest level and then executing the function **Load Current Selected Items from Meter** or **Load Marked Items from Meter** either in the **Communication** or the pop-up menu (called up with right mouse button). All values with the exception of the profiles are read.



© Landis+Gyr AG

6.3 Tree for Billing Values and Profiles

The tree for billing values and profiles is represented similarly to the dlms tree (see chapter 6.2), but with a filtered selection of visible items, i.e. only billing values and profiles.



The tree for billing data and profiles is only provided for base meters.

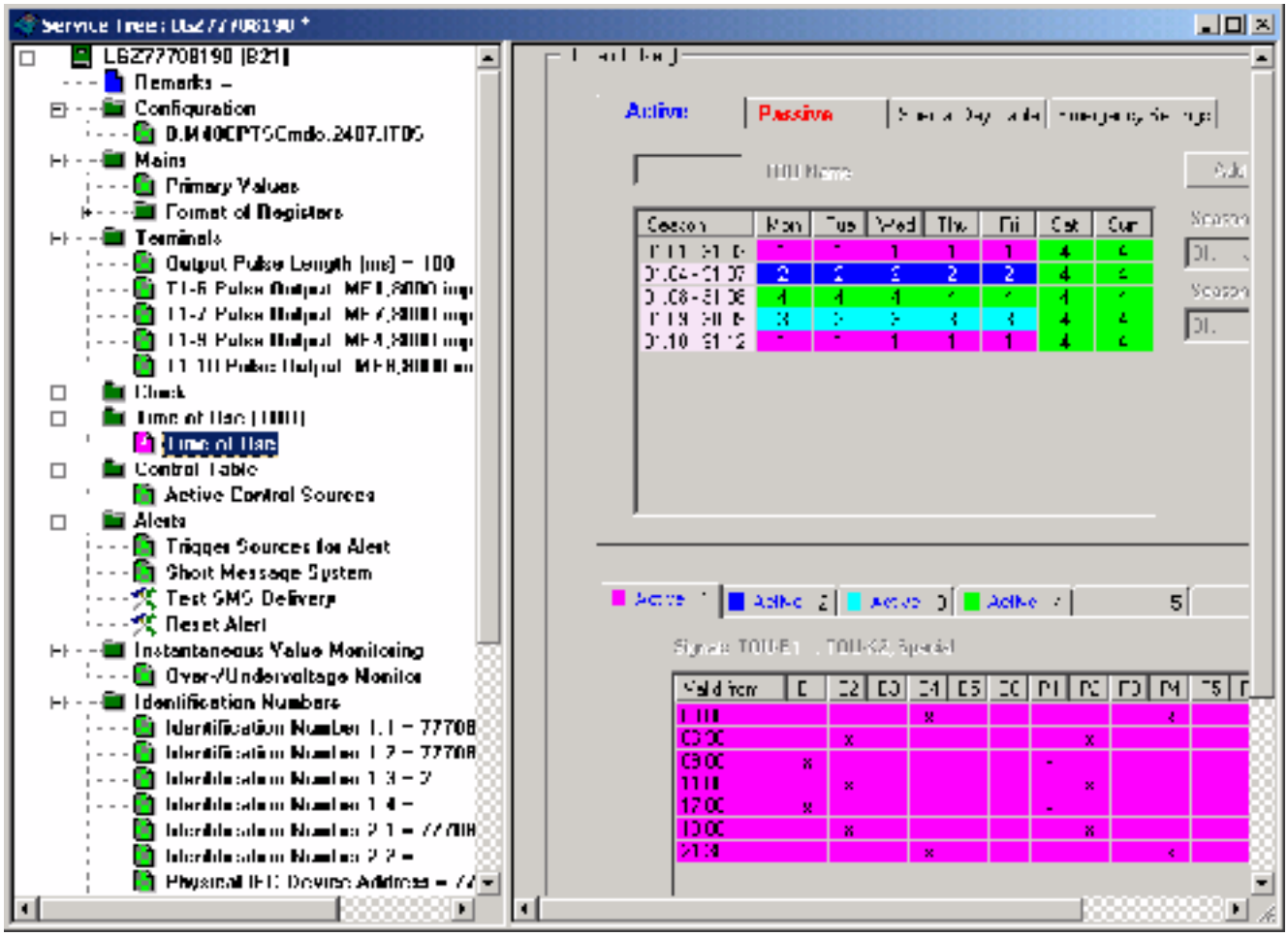
Explanations for profiles can be found in chapters 7.1 "Event Log Data" and 7.2 "Load Profile Data".

6.4 Service Tree

The service tree shows a selection of parameters, but no register values, independent of type of device. The parameters are read from the device automatically after call-up.

The service tree permits modification of the parameters displayed (except the configuration). In contrast with the parameterisation tree, individual parameters can be transmitted to the meter from the service tree.

The following example shows a part of a service tree:



Service trees can either be called up for the base meter or for a communication unit fitted in the meter.

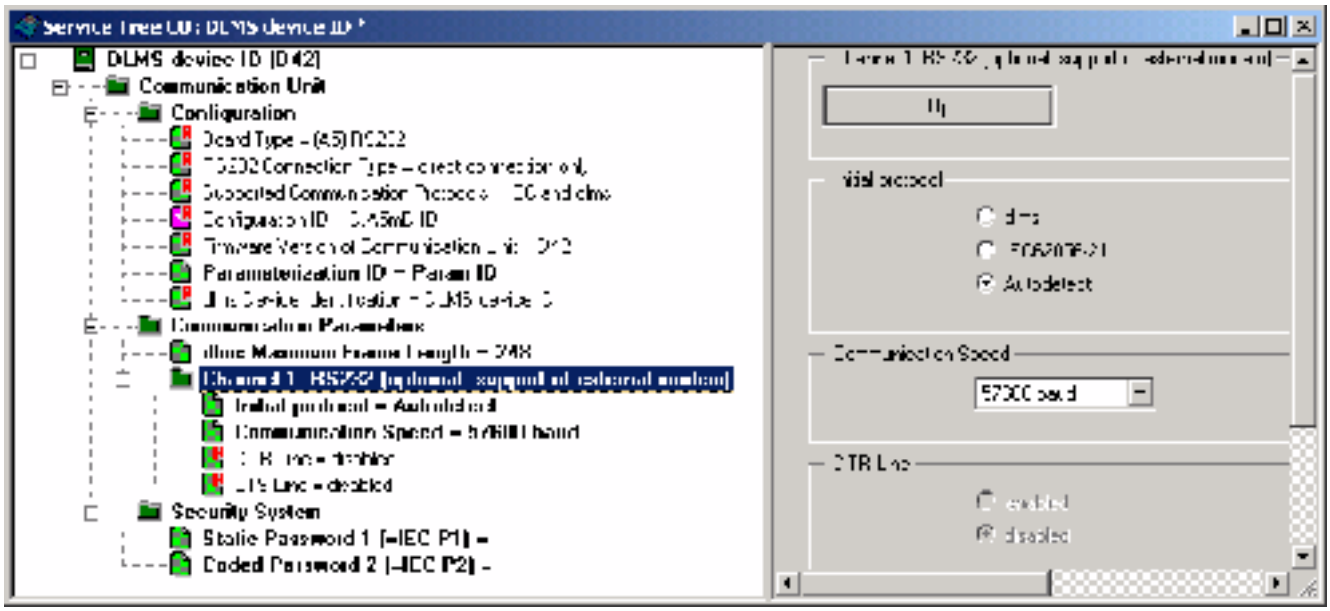
Parameters from the following parameter groups, for example, are contained in the service tree for the base meter depending on type of device:

- Configuration
- Primary data
- Calendar clock
- Time switch (TOU)
- Identification numbers
- Passwords

If further parameters are to be observed or modified, the parameterisation tree should be used.

© Landis+Gyr AG

All parameters for the corresponding version are included in the service tree for communication units. Example for a CU-A5 communication unit:



Descriptions of the individual parameters are contained in the functional description for the relevant meter or the relevant communication unit.

Marking data

Individual elements or groups of several elements for reading meters or transmitting to the meters can be selected in the service tree by marking. Selection is made hierarchically in principle, i.e. all subordinate elements, e.g. the contents of selected folders, are also selected automatically. To select several elements these must be marked, while it is sufficient to click on individual elements. Select the entry **Mark for Exchange** for each of the tree items to be marked after clicking either in the **Communication** menu or in the pop-up menu (called up with right mouse button). Alternatively the key combination [Ctrl]+[M] can also be used for marking. Marked elements and all higher-order folders are marked in the tree with blue arrows.

Transmitting data

The transmission of data to or from the meter can be started either in the **Communication** menu or in the pop-up menu (called up with right mouse button) with **Load Marked Items from Meter** or **Send Marked Items to Meter**.

Removing markings again

Markings can be deleted again individually or collectively either in the **Communication** menu or in the pop-up menu (called up with right mouse button) with **Unmark Item** or **Unmark All**.

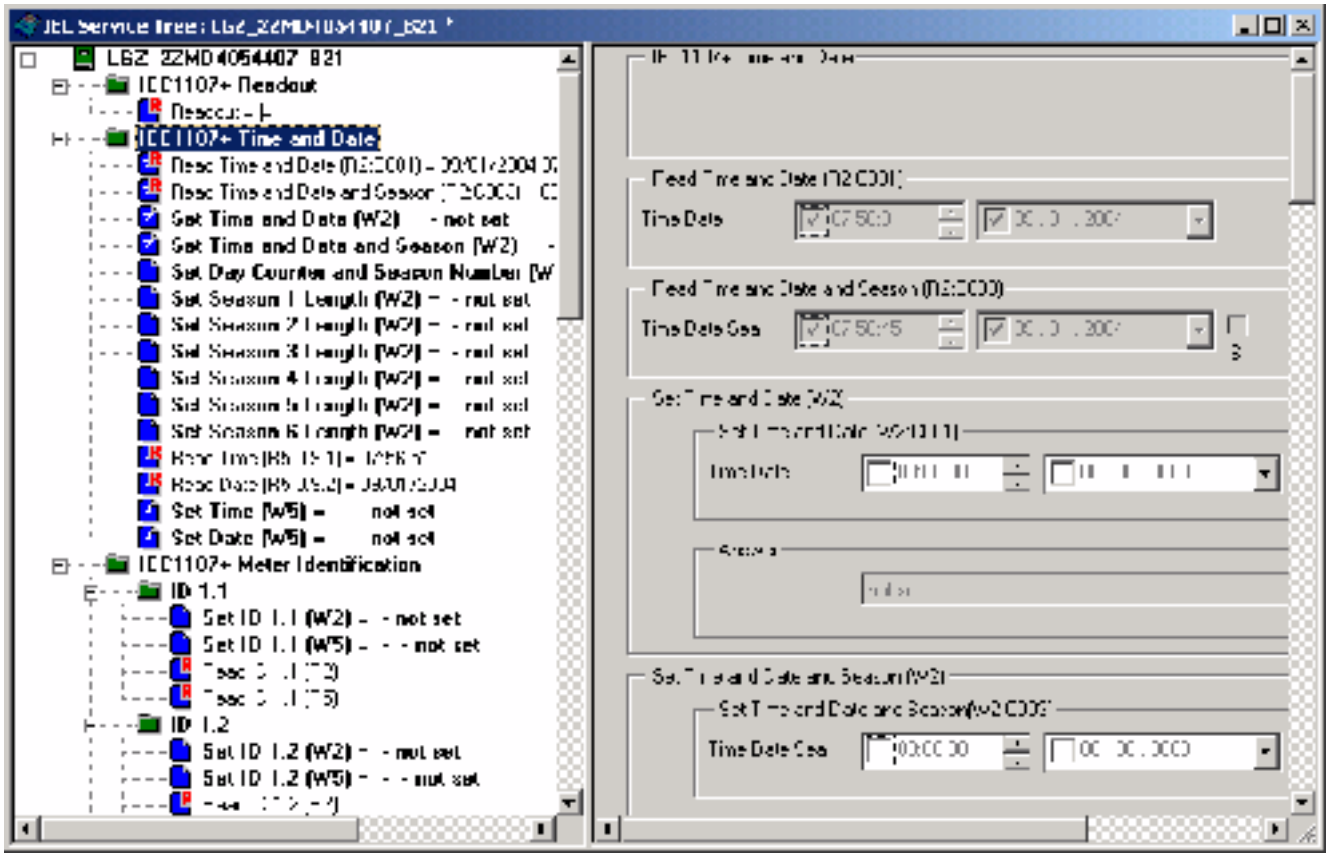
Saving markings

Markings can be saved with the device description ("Save" or "Save as" function) for repeated use for data transmissions.

6.5 IEC Service Tree

The IEC service tree is not a loaded association view of a meter, but a defined set of IEC commands which can be executed (e.g. setting time and date, data readout etc.).

The following example shows a part of an IEC service tree:


IEC Service Tree: LGZ_22MD4054407_821
LGZ 22MD4054407 821
IEC1107+ Readout
IEC1107+ Time and Date
Set Time and Date (W2) - not set
Set Time and Date and Season (W2) -
Set Day Counter and Season Number (W
Set Season 1 Length (W2) - not set
Set Season 2 Length (W2) - not set
Set Season 3 Length (W2) - not set
Set Season 4 Length (W2) - not set
Set Season 5 Length (W2) - not set
Set Season 6 Length (W2) - not set
Set Time (W5) - not set
Set Date (W5) - not set
IEC1107+ Meter Identification
ID 1.1
Set ID 1.1 (W2) - not set
Set ID 1.1 (W5) - not set
ID 1.2
Set ID 1.2 (W2) - not set
Set ID 1.2 (W5) - not set
Time Date
Time Date Sea

Selecting IEC commands

Individual IEC commands or groups of several IEC commands can be selected for execution in the IEC service tree. Selection is made hierarchically in principle, i.e. all subordinate elements, e.g. the contents of selected folders, are also selected automatically.

To select several IEC commands these must be marked, while it is sufficient to click on individual IEC commands.

Executing individual IEC commands

The execution of the selected IEC command can be started either in the **Communication** menu or in the pop-up menu (called up with right mouse button) with **Execute Selected IEC Command(s)**.

Marking and executing several IEC commands

Select the entry **Mark for Exchange** for each of the IEC commands to be marked after clicking either in the **Communication** menu or in the pop-up menu (called up with right mouse button). Alternatively the key combination [Ctrl]+[M] can also be used for marking. Marked IEC commands and all higher-order folders are marked in the tree with blue arrows. Execution of all marked IEC commands can then either be started in the **Communication** menu or in the pop-up menu (called up with right mouse button) with **Execute Marked IEC Command(s)**.

© Landis+Gyr AG

Removing markings again

Markings can be deleted again individually or collectively either in the **Communication** menu or in the pop-up menu (called up with right mouse button) with **Unmark Item** or **Unmark All**.

Saving markings

Markings can be saved with the device description ("Save" or "Save as" function) for repeated use for executing IEC commands.

IEC commands

A description of all IEC commands contained in the IEC service tree can be found in chapter 12 "Formatted Commands According to IEC 62056-21".

Access levels

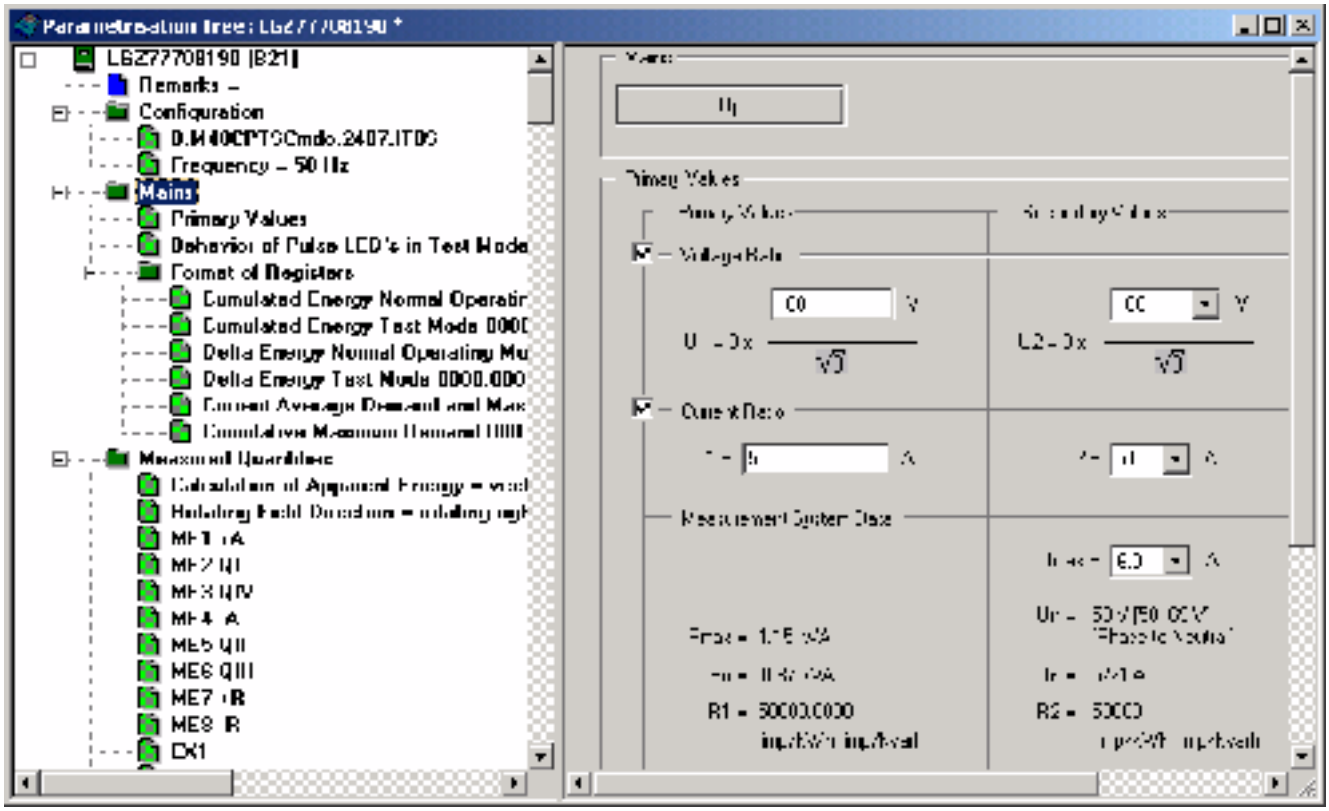
When using the IEC protocol only the 5 access levels 0 to 4 are available in the MAP120 communication center (see also chapter 11.4 "Access Levels and their Application").

6.6 Parameterisation Tree

The parameterisation tree displays all parameters of a meter, but no register values. When called up, the parameters are read out automatically from the device into the parameterisation tree.

The parameterisation tree permits re-parameterisation of meters (except configuration), comparison of parameters in the device and in the tree and matching of device and tree. In contrast with the service tree, only complete parameter sets but no individual parameters are transmitted from the parameterisation tree.

The following example show a part of a parameterisation tree:



The parameterisation tree is only provided for base meters. The service tree must be used for re-parameterisation communication units.

Selecting data

No individual elements nor groups of several elements can be selected in the parameterisation tree for reading the meter or transmission to the meter, since only complete parameter sets but no individual parameters can be read from the meter or written in the meter.

Transmitting data

The transmission of parameter sets to or from the meter can either be started in the **Communication** menu or in the pop-up menu (called up with right mouse button) with **Load from Meter** or **Send to Meter**.

Importing MAP190 files

MAP device document files (*.prd) with parameterisation data exported from MAP190 can be opened in MAP120 as parameterisation tree (see chapter 8.1.2 "Opening Existing Device Descriptions").

© Landis+Gyr AG

Special functions

The following functions described in the following sub-chapters can only be used with parameterisation trees:

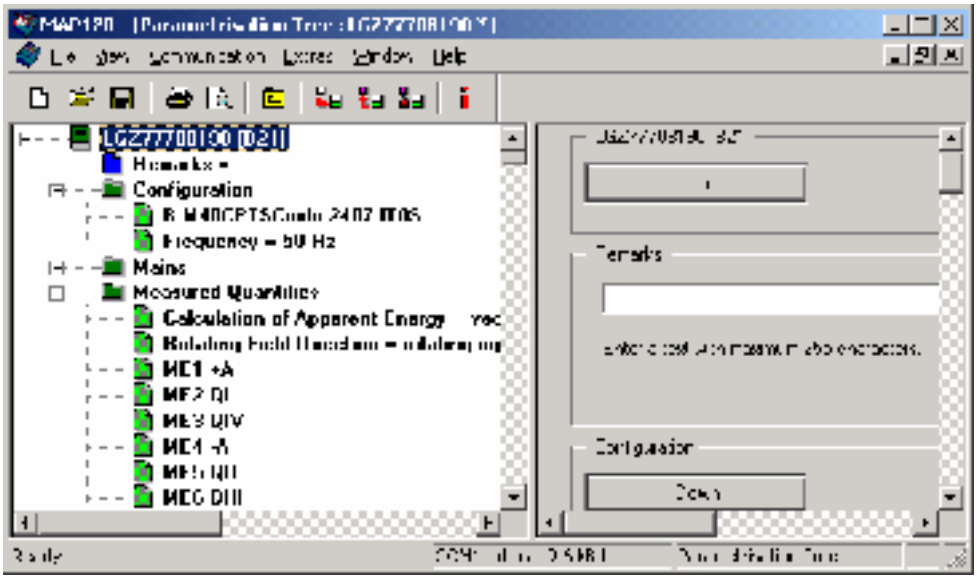
- Switching the certification feature on or off
- Comparing parameterisation tree to file or meter
- Exporting TOU table

6.6.1 Switching the Certification Feature On or Off

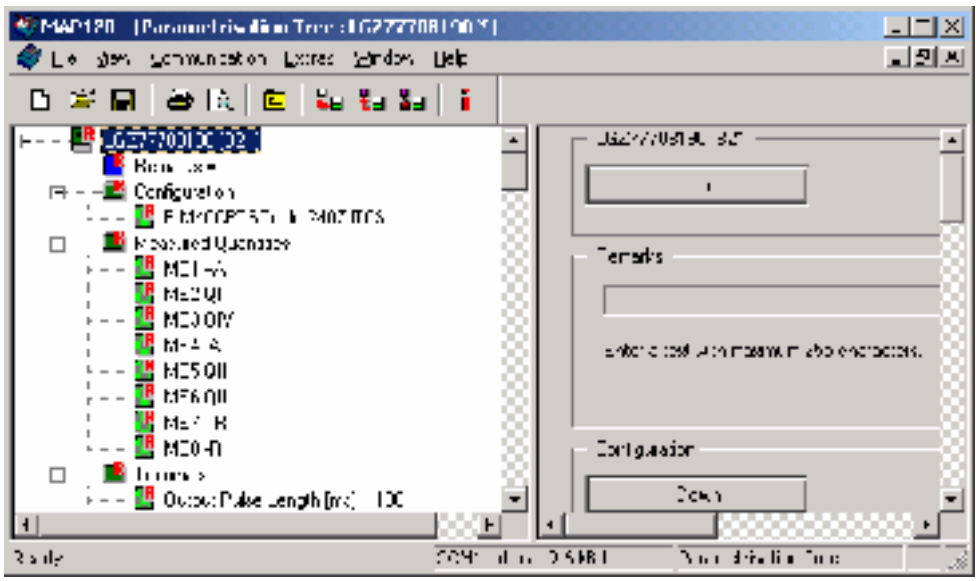
With the changeover function "Certification Feature" the tree representation can be changed over and returned from normal to certification feature representation. This function is only relevant for Germany.

Procedure:

1. Select **Certification Feature** from the **View** menu.
   A tick in front of the menu item indicates that the certification feature representation is currently switched on. After clicking on the menu item the tick in front of it disappears and the normal tree representation is shown.



2. Select **Certification Feature** again from the **View** menu if you want to show the certification feature representation (toggle function).
   No tick in front of the menu item indicates that the certification feature representation is currently switched off. After clicking on the menu item the tick in front of it reappears and the certification feature representation is displayed.

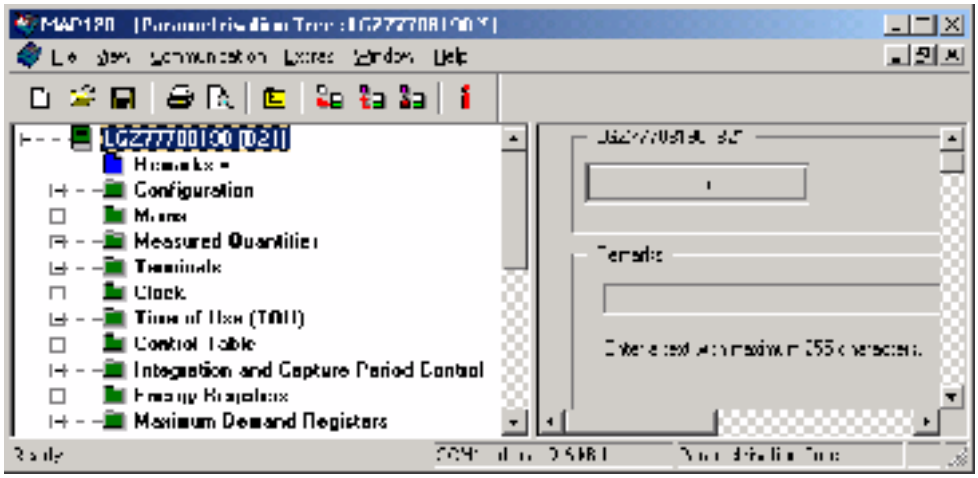


6.6.2 Comparing Parameterisation Tree to File

For parameter comparison with a file (only available for parameterisation trees, but not for all types of device) the active device description is compared with a selected file. Differences detected are marked.

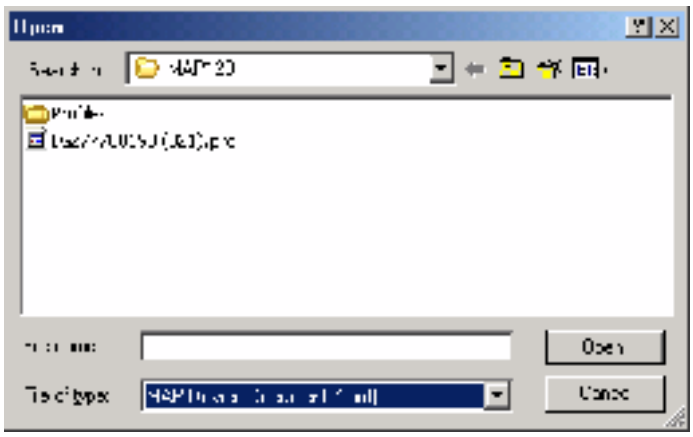
Procedure:

1. Activate the device description, which you want to compare to a stored device description.



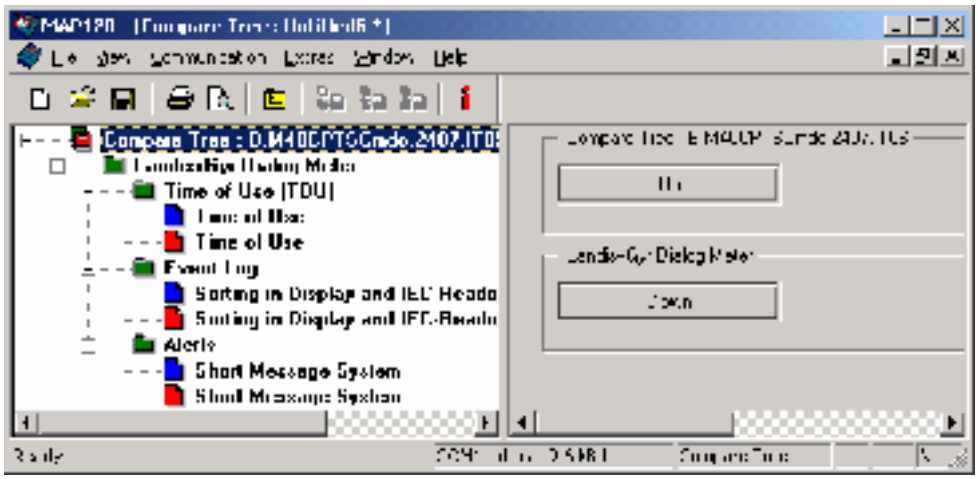
2. Select **Compare to File...** from the **Extras** menu.
   The "Open" window appears (this is an operating system dialog window and therefore the dialog language depends on the version of your Windows user interface).
3. Select your personal data folder in the displayed tree structure if it is not already displayed.
4. In the selection box "File of type" select either "MAP Parameterisation Document" or "MAP Device Document".

© Landis+Gyr AG



5. Double-click on the desired file name or mark it and then click on **Open**.
   Comparison of the two device descriptions is performed and the result displayed in a compare tree. This only contains the different tree items.

6. Expand the folder structure to display the differences.
   The tree items for the active device description are shown in green and those for the file in red. The details are shown in the right-hand half of the window.

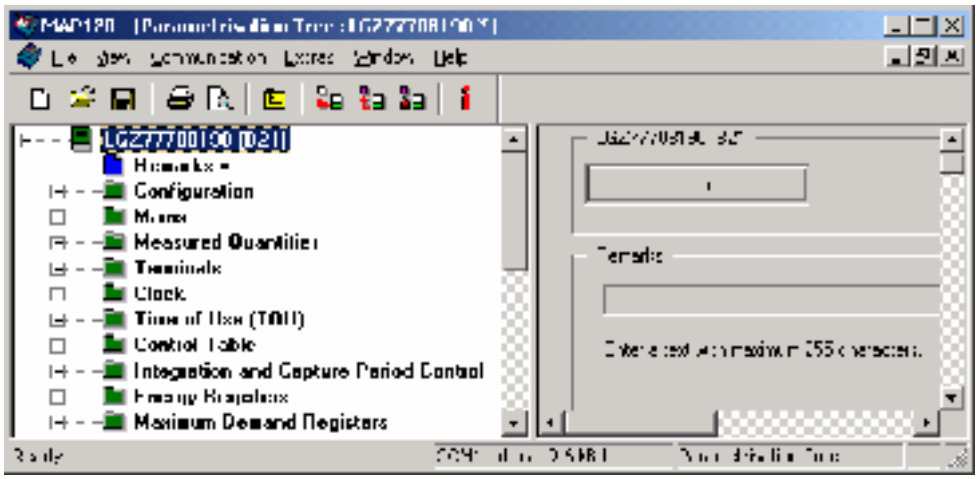


6.6.3 Comparing Parameterisation Tree to Meter

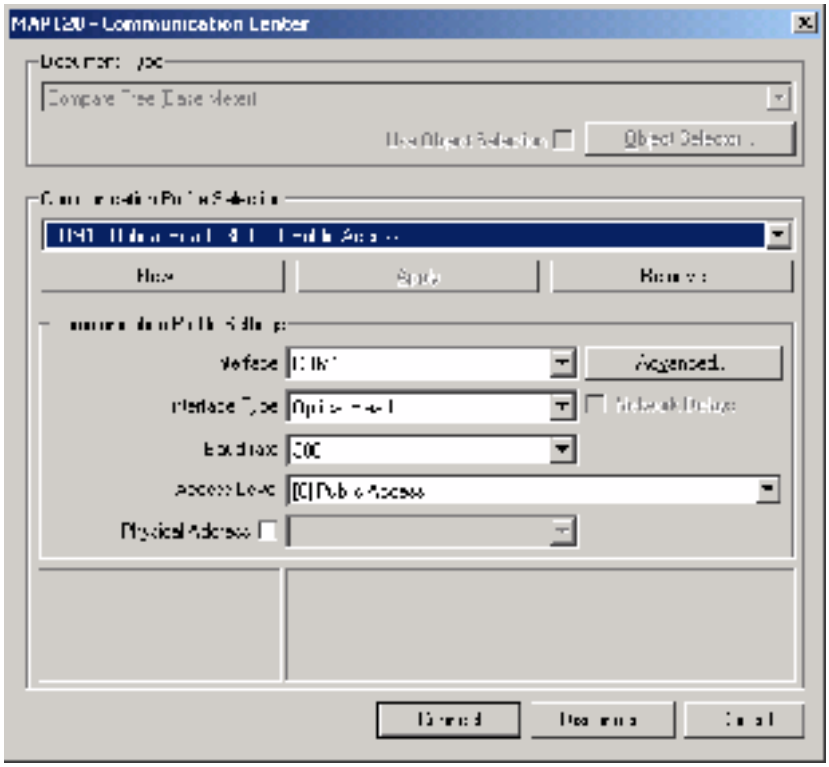
For parameter comparison with a meter (only available for parameterisation trees, but not for all types of device) the active device description is compared with a connected meter. Differences detected are marked.

Procedure:

1. Activate the device description, which you want to compare to the connected meter.



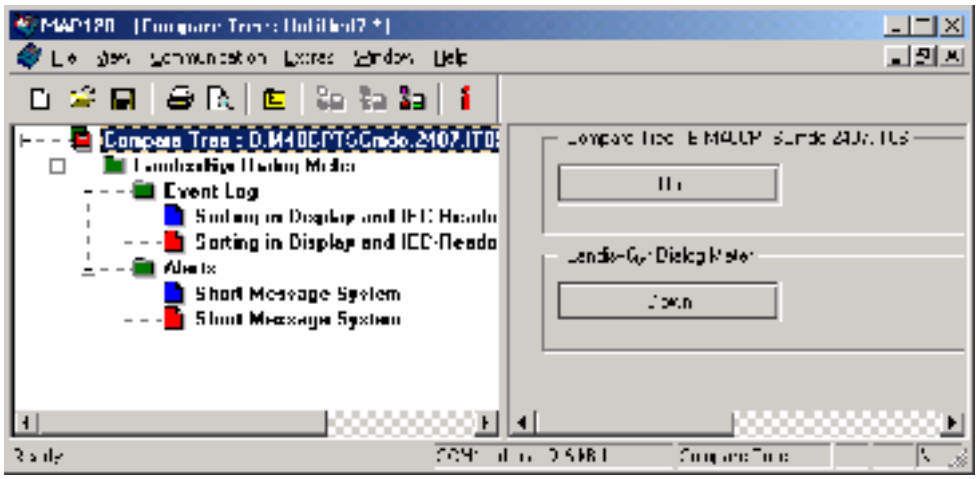
2. Select **Compare to Meter...** from the **Extras** menu.
   The "MAP120 - Communication Center" window appears.



3. Click on **Connect**.
   If the activated device description is connected to the meter, this connection must first be broken. Communication is started and the comparison performed. A progress bar is displayed during this process. When the comparison is completed, the result is displayed in a compare tree. This only contains the different tree items.

© Landis+Gyr AG

4. Expand the folder structure to display the differences.
   The tree items for the active device description are shown in green and those for the connected meter in red. The details are shown in the right-hand half of the window.

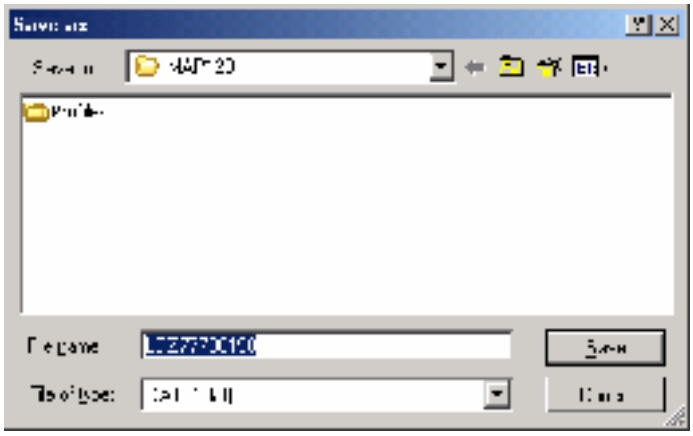


6.6.4 Exporting TOU Table

With the "Export TOU table" function the switching table can be exported from parameterisation trees to a file. These data can be used for download with an IEC-based tool, e.g. a hand-held terminal. Please contact your Landis+Gyr agent for further details.

Procedure:

1. Activate the window with the parameterisation tree from which the switching table is to be exported.
2. Select **Export TOU to file (IEC W4)...** from the **File** menu.
   The "Save as" window appears (this is an operating system dialog window and therefore the dialog language depends on the version of your Windows user interface).



3. Select the desired folder in the displayed tree structure if it is not already displayed.
4. Enter the desired designation for the switching table in the "File name" entry box.
   The name of the meter connected is suggested. This suggestion can be overwritten.

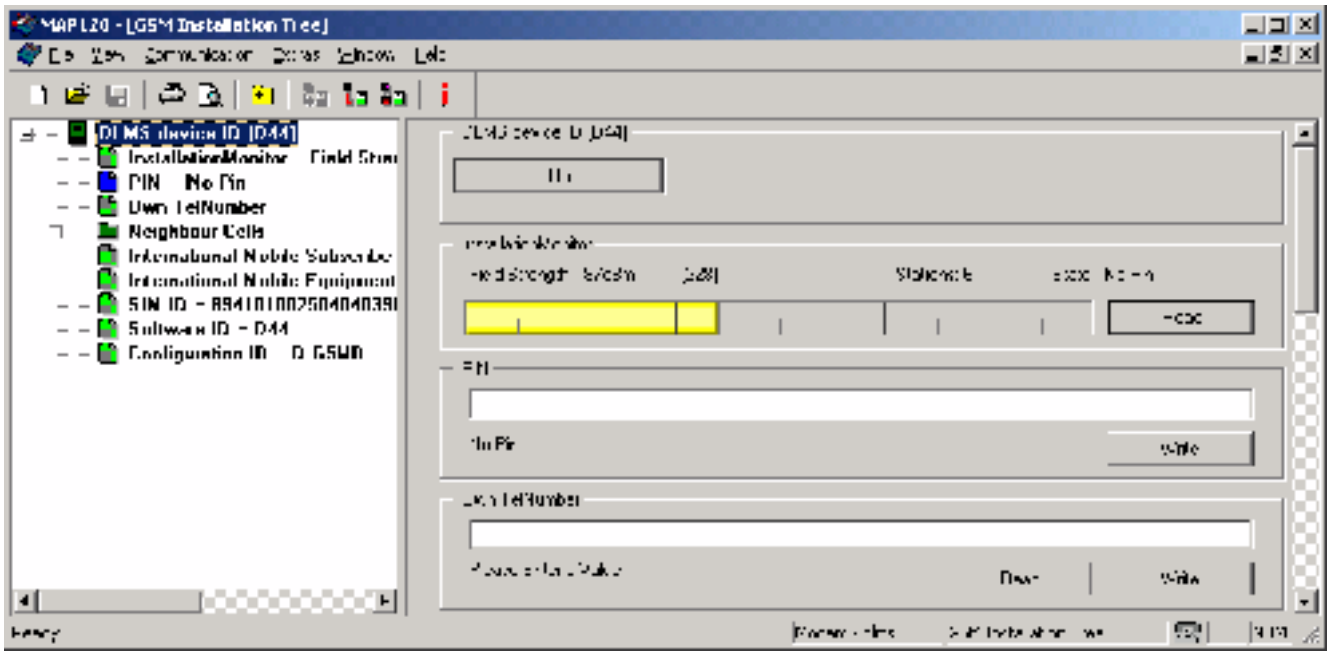
5. Click on **Save**.
   The switching table is saved. A corresponding message is displayed.

6. Click on **Ok** to confirm the message.

6.7 Installation Tree for GSM

The installation tree for GSM is only available for communication units. Certain values, such as the present received signal field strength, are displayed here as bar chart to support the installation of an integrated GSM modem.

Example:



Detailed instructions for the use of the installation tree for GSM can be found in the document "Point-to-point connection with internal GSM modem" H 71 0200 0147 en.

© Landis+Gyr AG

7 Data Handling

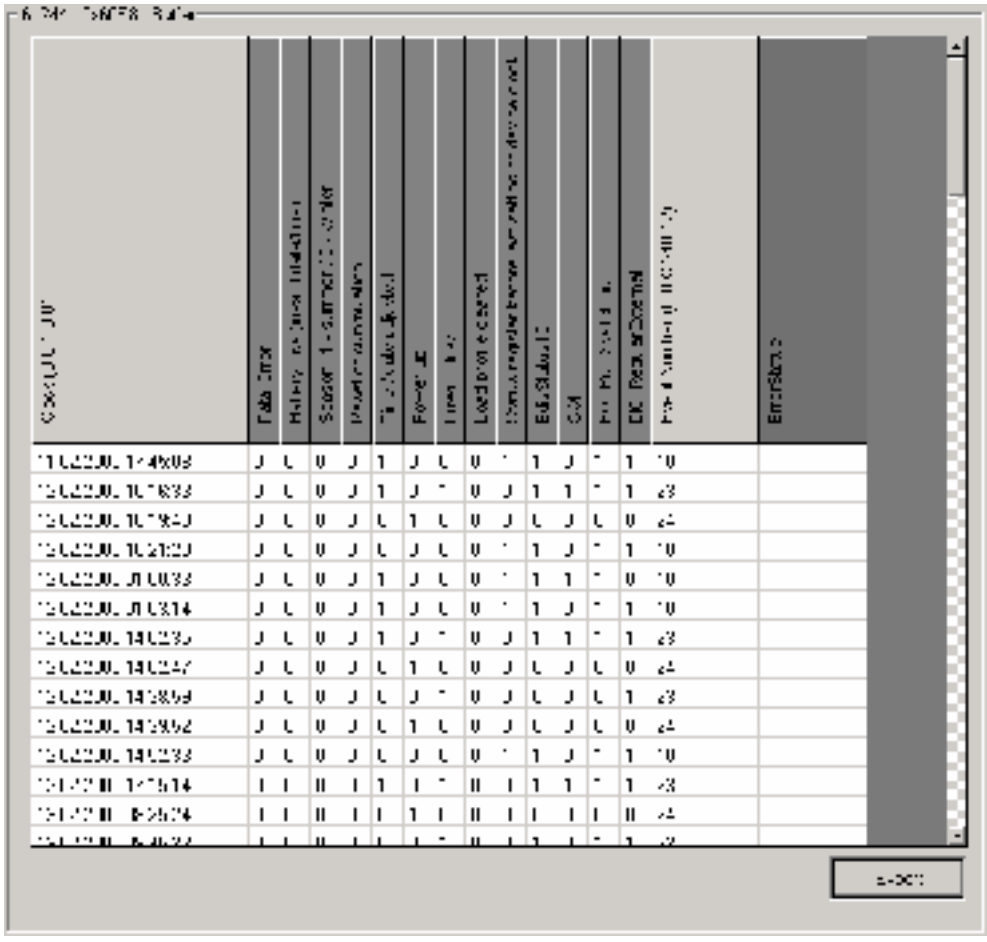
Most data represented in device description windows can be handled and interpreted easily, since standard Windows elements are used to display them in the right-hand half of the device description window. This applies for instance to entry boxes, selection boxes, check boxes, radio buttons, etc.

More complex data such as event logs, load profiles or stored values also need more complex means of representation in the form of tables, which are partly provided with further control elements.

The following sub-chapters give an introduction on how to handle these types of data.

7.1 Event Log Data

Event log data read from the buffer of the connected meter into the device description window are displayed in a table:



The event log table has the following columns:

- Clock (light grey header) indicating the date and time of an event.
- All defined individual errors (dark grey header) indicating the occurrence with a "1" and non-occurrence with a "0". If more than one individual error is marked with a "1", this indicates normally that follow-up errors have occurred, e.g. during a voltage drop (power down event).

© Landis+Gyr AG

- Event Number (light grey header) with the codes for individual events (23 indicates for instance a power down event and 24 a power up event). The possible event types are listed with their numbers in the following table.

A scroll bar allows scrolling through the list entries (the header remains in a non-scrolling region).

Event types

The following table shows which event types can be recorded under which event number in the event log:

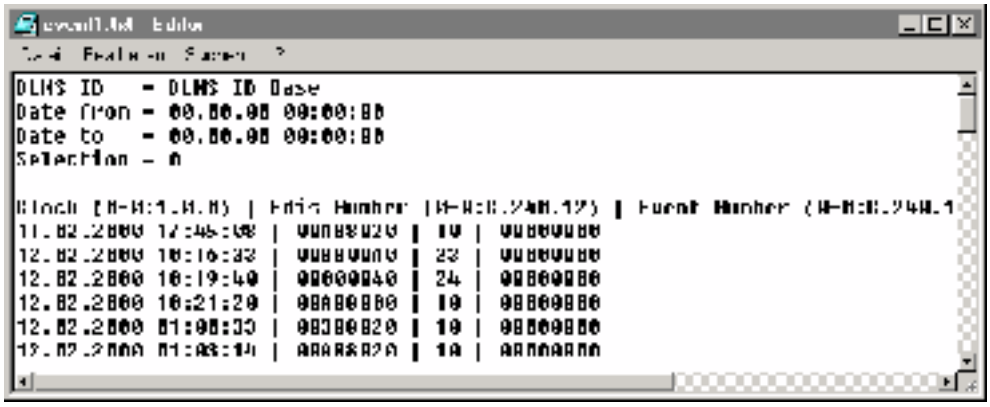
Event type	Number
Tariff registers cleared	2
Load profile memory cleared	3
Battery charge low	5
Battery voltage ok	7
Meter reset performed	8
Summer/winter changeover	9
Time/date newly set (old values)	10
Time/date newly set (new values)	11
Control inputs status changed	13
Undervoltage phase L1	17
Undervoltage phase L2	18
Undervoltage phase L3	19
Overvoltage phase L1	20
Overvoltage phase L2	21
Overvoltage phase L3	22
Voltage failure	23
Voltage return	24
Overcurrent phase L1	25
Overcurrent phase L2	26
Overcurrent phase L3	27
Overcurrent neutral	28
Power factors fallen below (4)	29 to 32
Power factors exceeded (8)	33 to 40
Error during self-test (4)	45 to 48
Voltage failure phase 1	49
Voltage failure phase 2	50
Voltage failure phase 3	51
Error "Battery voltage low"	65
Error "Time/date invalid"	66
Error "Access measuring system memory"	75
Error "Time base"	76

Event type	Number
Error "Ripple control receiver"	78
Error "Communication unit"	79
Error "Display and control panel"	80
Error "Internal overflow in measuring system"	89
Error "Measuring system failed"	90
Error "Re-programming failed"	91
Error "Setting mode failed"	92
Error "System failed"	93
Error "Communication blocked"	94
Error "Wrong flash memory identification"	95
Error "Wrong function extensions identification"	96
Failure of an SMS message transmission to GSM modem	105
Important operating message recorded	106

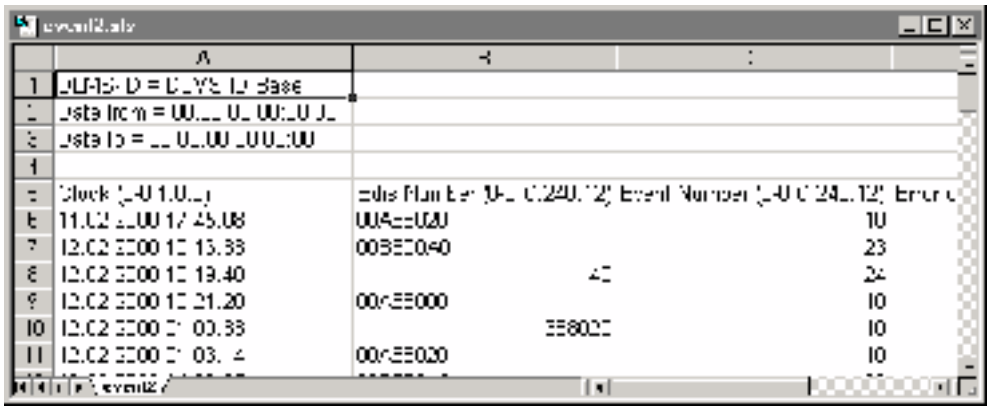
Data export

Clicking on the **Export** button opens a standard Windows "Save as" dialog where you can select the path, file name and file type for the file with the exported event data. The following file types can be selected:

- Raw Text Format (*.txt)
- Excel Format (*.xls)



Example of exported event data in raw text format.



Example of exported event data in Excel format.

© Landis+Gyr AG

7.2 Load Profile Data

Several control elements allow either all data or only a data selection of the load profile data to be read from the meter. There are the following possibilities:

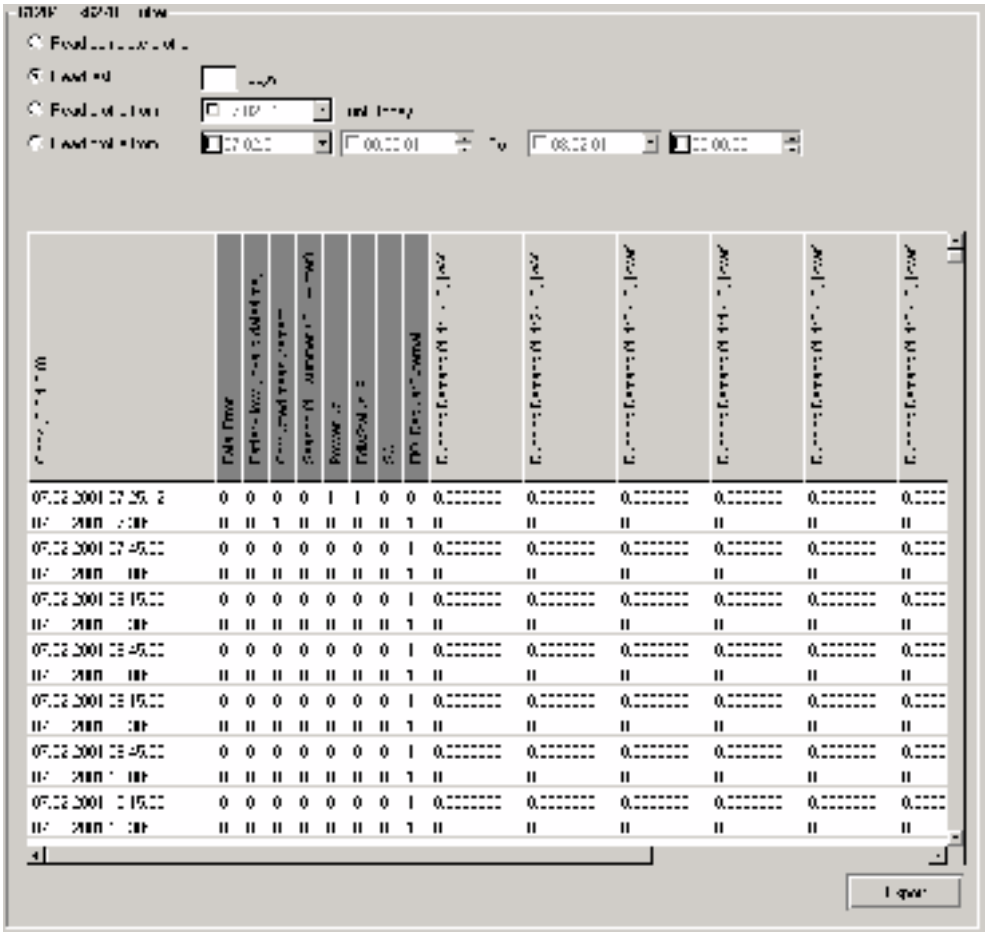
- Read complete profile
- Read last x days (where x has to be entered)
- Read profile from a certain start date until today
- Read profile from a certain start date and time to an end date and time

Note

Shortening the readout time by data selection

It is strongly advisable to make a data selection prior to reading the load profile buffer, since this process can be extremely time consuming when reading the complete profile (specially when the meter connected has a short integrating period).

Load profile data read from the buffer of the connected meter into the device description window are displayed in a table:



The load profile table has the following columns:

- Clock (light grey header) indicating the date and time of an entry.
- Some important individual errors (dark grey header) indicating the occurrence with a "1" and non-occurrence with a "0". If more than one individual error is marked with a "1", this indicates normally that follow-

up errors have occurred, e.g. during a voltage drop (power down event). The possible individual errors are listed with their numbers in the following table.

- Register values (light grey header) of measured values which can be recorded in the load profile, e.g.:
  - Energy tariff registers (status or advance)
  - Total energy registers
  - Demand mean values (P last integrating period)
  - Power factor mean values (PF last integrating period)
  - Phase voltages as mean value in integrating period
  - Phase currents as mean value in integrating period
  - Mains frequency as mean value in integrating period

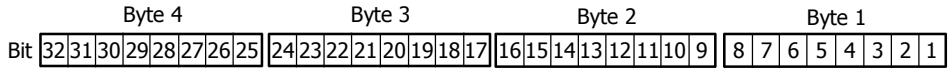
Scroll bars allow scrolling through the list entries (the header remains in a non-scrolling region).

Error status word

The following table shows which individual errors are displayed under what numbers in the load profile (corresponding to the bit of the status word).

The length of the status word can be parameterised to 2 or 4 bytes, i.e. individual errors 1 to 16 can always be displayed in the load profile, while errors 17 to 32 are only displayed as an option (when the status word has been parameterised to 4 bytes).

Bit assignment in error status word:



Number	Error description
1	Fatal error occurred
2	Power reserve of calendar clock exhausted (time invalid)
3	Incomplete measurement owing to integrating period too short
4	Summer or winter time Depending on the parameterisation this bit is static (1 = summer, 0 = winter) or dynamic, i.e. only active during the first recording period following the change from summer to winter time and vice-versa.
5	Resetting performed
6	Time/date set (time stamp of new time)
7	Voltages returned (power up)
8	Voltages (3 phases) failed (power down)
9	not used
10	not used
11	not used
12	not used
13	not used

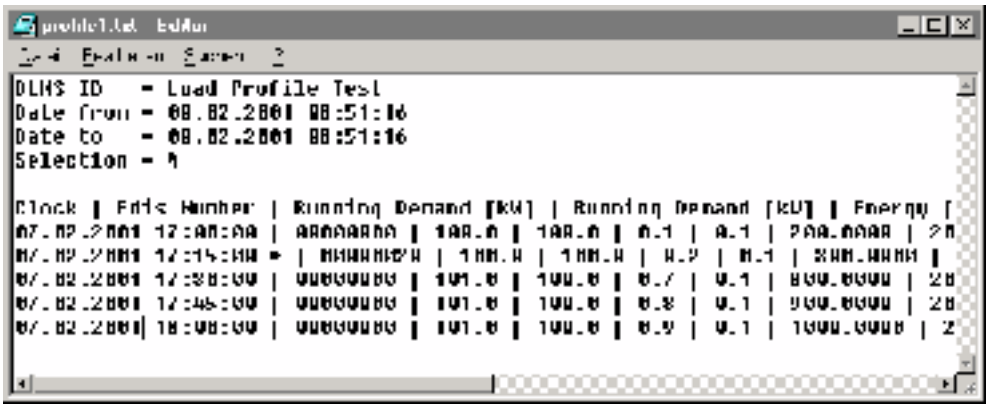
© Landis+Gyr AG

Number	Error description
14	Event log completely deleted
15	Load profile memory completely deleted
16	Status word recorded before setting last time (time stamp of old time)
17	reserved
18	reserved
19	reserved
20	Integrating period started (SOI - start of interval)
21	Integrating period ended by tariff changeover (EOI - end of interval)
22	Integrating period ended prematurely (e.g. by time setting)
23	Integrating period ended normally by external control
24	Integrating period ended normally by internal control
25 to 32	reserved for future extensions

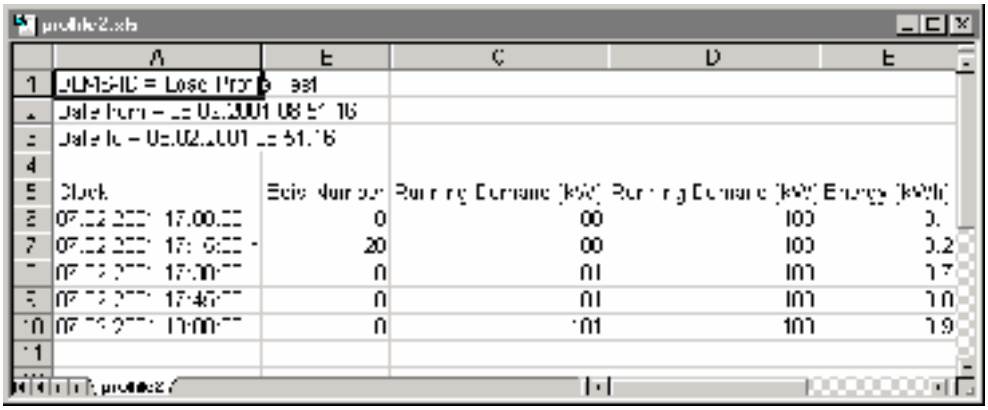
Data export

Clicking on the **Export** button opens a standard Windows "Save as" dialog where you can select the path, file name and file type for the file with the exported load profile data. The following file types can be selected:

- Raw Text Format (*.txt)
- Excel Format (*.xls)



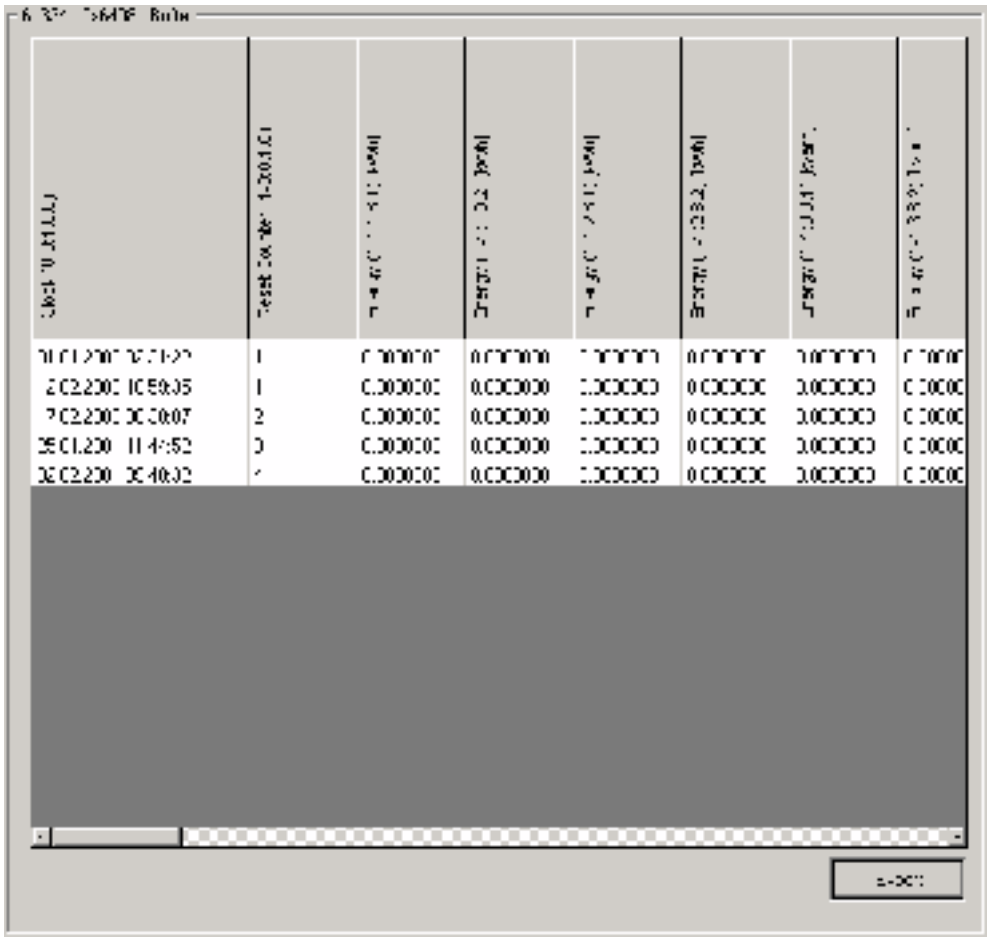
Example of exported load profile data in raw text format.



Example of exported load profile data in Excel format.

7.3 Stored Values

Stored values read from the buffer of the connected meter into the device description window are displayed in a table:



The stored values table has the following columns:

- Clock indicating the date and time of the stored values.
- Reset counter reading.
- Stored values of the individual energy and demand registers.

Scroll bars allow scrolling through the list entries (the header remains in a non-scrolling region).

Data export

Clicking on the **Export** button opens a standard Windows "Save as" dialog where you can select the path, file name and file type for the file with the exported stored values data. The following file types can be selected:

- Raw Text Format (*.txt)
- Excel Format (*.xls)

© Landis+Gyr AG

8 Application of MAP120 Functions

This chapter contains instructions for the use of functions of the Landis+ Gyr MAP120 Parameterization Tool, which have not already been explained in preceding chapters. The sequence corresponds to the menu structure of the application. The table of contents should be used to find the required function.

8.1 File Handling Functions

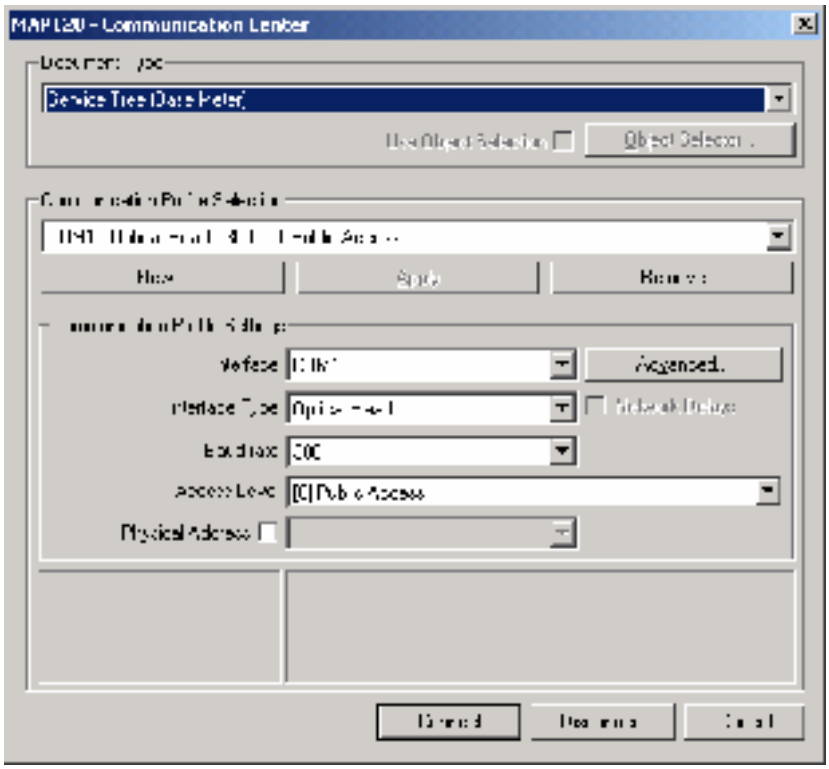
File handing functions can be called up in the **File** menu.

8.1.1 Creating New Device Descriptions

The function "New" generates a new blank tree structure, in which the model of the meter connected can then be loaded.

Procedure:

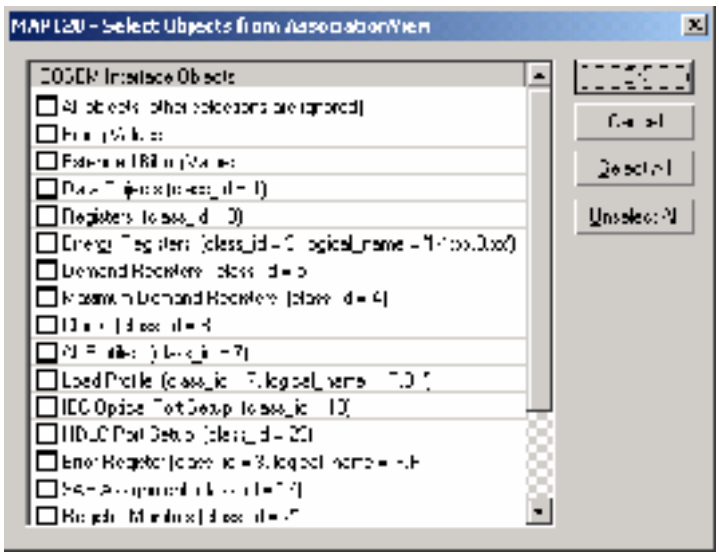
1. Click on in the toolbar or select **New** from the **File** menu.
   The "MAP120 - Communication Center" window appears showing the last used settings.



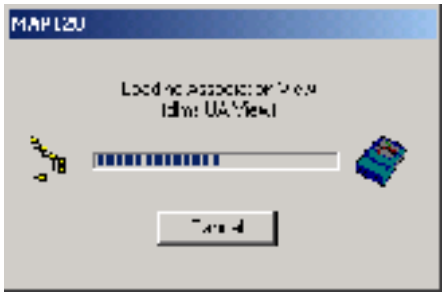
2. Select the desired document type in the corresponding selection box. The available document types are explained in chapter 6 "Description of Types of Tree".
3. If you have selected the document type "dlms User Association View", you have the opportunity to filter the objects displayed in the tree. If another document type was selected or if no filtering is desired, continue with point **8**.

© Landis+Gyr AG

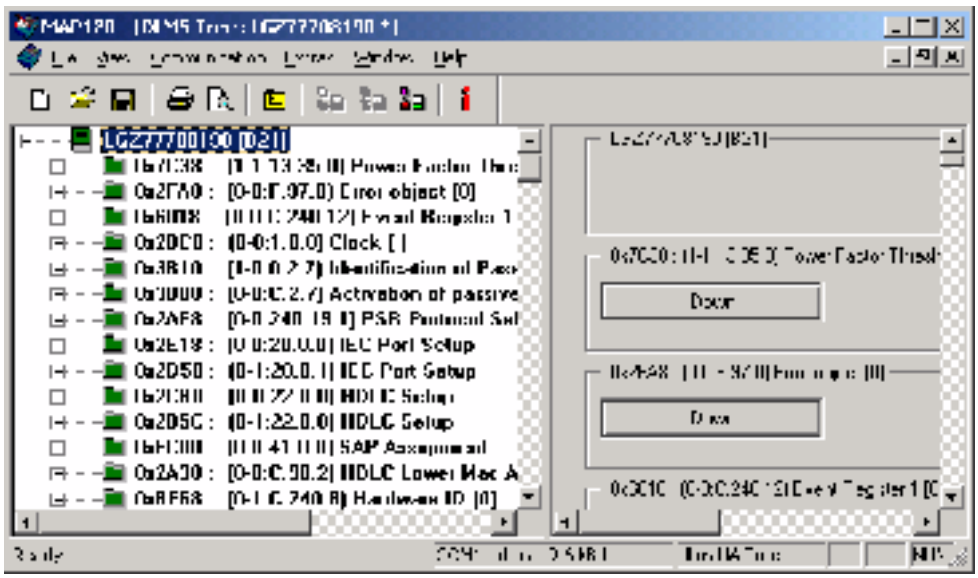
4. Activate the check box "Use Object Selection".
   The button **Object Selector...** will be released.
5. Click on **Object Selector...**.
   The "MAP120 - Select Objects from Association View" window appears.



6. Select the objects you want to read from the meter by activating the corresponding check boxes.
   Using **Select All** you can select all check boxes at once.
7. Click on **OK**.
   The "MAP120 - Select Objects from Association View" window disappears.
8. Select the desired communication profile in the corresponding selection box.
   If no suitable communication profile is found in the selection box, you can also create a new one according to chapter 5.1.2 "Communication Profiles").
9. Click on **Connect**.
   The communication is started and the meter model is loaded from the connected meter. During this operation, which can last up to several minutes (depending on the number of objects in your meter), a progress bar is displayed.



After termination of the readout the loaded meter model is displayed in the new device description window. The designation in the title bar of the window depends on the meter connected.



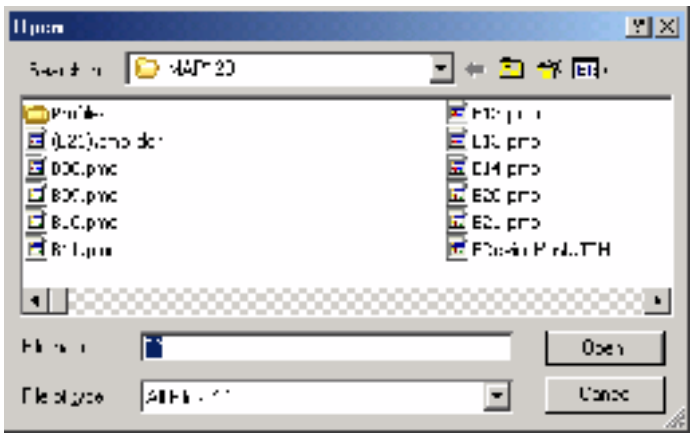
Now you can work with the loaded tree, i.e. reading values and parameters from the meter, modifying them and writing them back to the meter.

8.1.2 Opening Existing Device Descriptions

The "Open" function allows stored device descriptions to be opened. The selected device description will be represented in a device description window.

Procedure:

1. Click on in the toolbar or select **Open...** from the **File** menu.
   The "Open" window appears (this is an operating system dialog window and therefore the dialog language depends on the version of your Windows user interface).



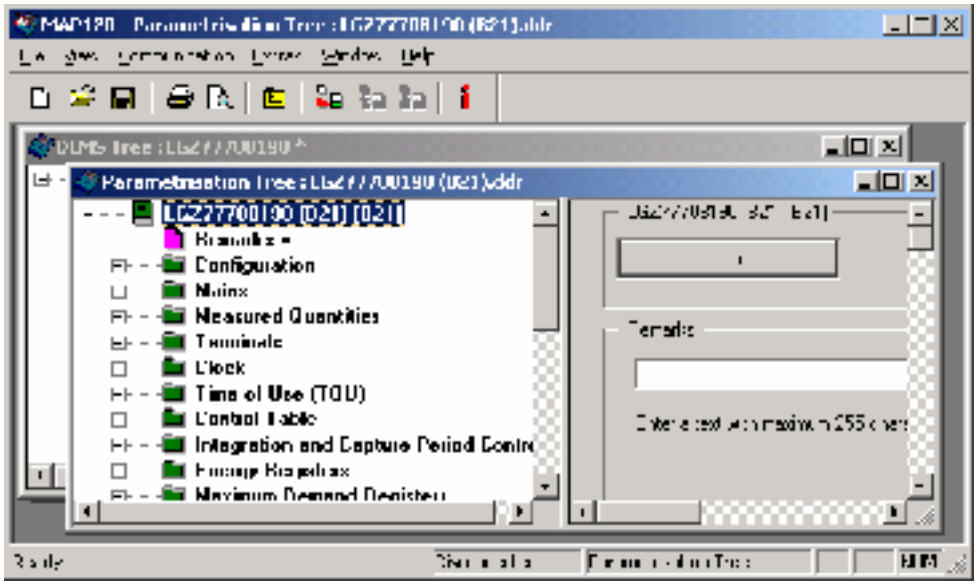
2. Select your personal data folder in the displayed tree structure if it is not already displayed.
3. Select the desired document type in the selection box "File of type". The display is then reduced to the selected document type. Default setting is "All Files (*.*)". The following further document types can be available (depending on the license):
   - MAP Parameterisation Document (*.ddr) = File with param. tree
   - MAP Service Document (*.dds) = File with service tree
   - MAP Billing Values and Profiles (*.ddp)

© Landis+Gyr AG

- MAP dlms User Association Document (*.ddu) = File with dlms Tree
- MAP IEC Document (*.ddi) = File with IEC service tree
- MAP GMS Installation Document (*.ddg) = File with GSM inst. tree
- MAP Device Document (*.prd) = MAP190 File with param. tree

4. Double-click on the desired entry in the list or select it and then click on **Open**.
   The selected device description will be loaded and viewed.
   It is also possible to select a recently opened device description from the MRU (most recently used) list in the **File** menu. This list contains as maximum the last 6 opened file names. Clicking on a list entry opens the corresponding device description directly.

The device description just opened becomes the active window.



8.1.3 Closing Device Description Windows

The "Close" function closes the active device description window with **all** view masks belonging to it.

Note that using the button to close the active device description window only closes the currently active view mask.

Procedure:

1. Activate the device description window to be closed.
2. Select **Close** from the **File** menu.
   The active window will be closed. If the device description was modified but not yet saved, the "Save as" window appears and allows you to save it.

8.1.4 Saving Device Descriptions

The "Save" function saves the device description in the active window under the original name. If the device description was newly created or is to be saved under a new name, you have to proceed as described in chapter 8.1.5 "Saving Device Descriptions under a New Name".

Procedure:

1. Activate the window with the device description to be saved.
2. Click on in the toolbar or select **Save** from the **File** menu.
   If the device description was modified since it was last saved (recognisable by the asterisk in the title bar) the modified data will overwrite the previously stored data without any warning.
   If the device description was not modified (no asterisk in the title bar) it will not be saved again.
   If a new device description has not yet been saved, it must be saved using the "Save As" function described in the next chapter.

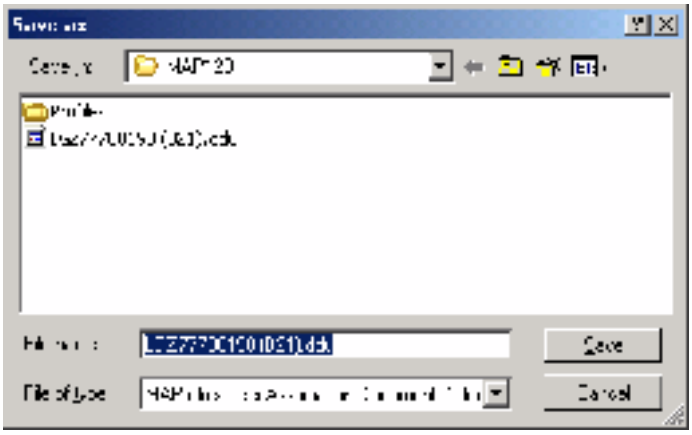
8.1.5 Saving Device Descriptions under a New Name

The "Save As" function saves the device description in the active window under a new name.

Procedure:

1. Activate the window with the device description to be saved under a new name.
2. Select **Save As...** from the **File** menu.
   The "Save as" window appears (this is an operating system dialog window and therefore the dialog language depends on the version of your Windows user interface).
3. Select the desired data folder in the displayed tree structure if it is not already displayed.
   A list of all stored device description files of the same type will be shown.

© Landis+Gyr AG



4. Enter the desired name for the device description in the entry box "File name".
   If the device description was newly created, the proposed name corresponds to the connected meter. Otherwise the name formerly used is proposed. You can overwrite this proposal.
5. Click on **Save**.
   The device description will be saved. The device description name in the title bar changes according to the selected name.

8.1.6 Printing Device Descriptions

The "Print" function prints out the device description in the predefined form (see chapter 8.1.7 "Defining the Print Layout").

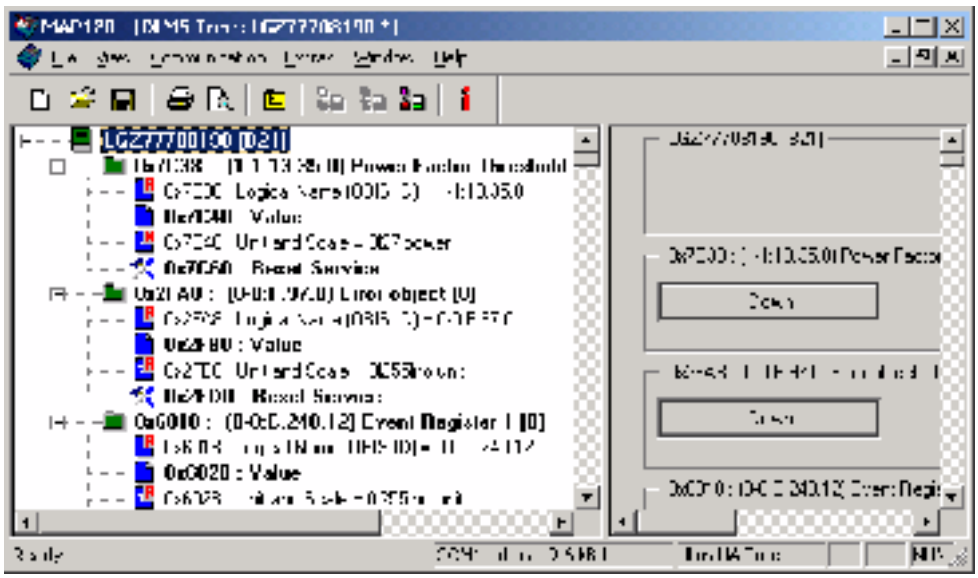
Note

Selecting printer before printout

Printing problems are often caused by a change of printer selected. It is therefore recommended to select the printer already before printing according to chapter 8.1.9 "Setting up the Printer".

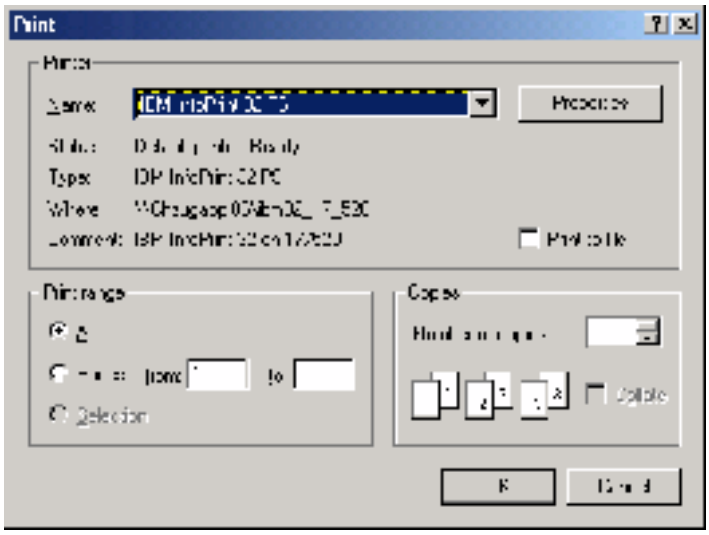
Procedure:

1. Activate the device description window you want to print.
2. Expand or collapse the folders as they should appear on the printout.
   To do so click on the corresponding expansion signs ⊞ in the tree.
   If you want to see all items of the tree you can expand the whole tree at once by pressing the "*" key of the numerical keyboard.
   If you always want to print the tree fully expanded activate the corresponding check box in the "Page Setup" window (see chapter 8.1.7 "Defining the Print Layout").



3. Select **Print...** from the **File** menu.
   The "Print" window appears.
   Clicking on in the toolbar would start printing immediately without displaying the "Print" window.

4. Make the necessary settings (number of pages and copies).
   It is recommended not to change the type of printer at this stage to avoid printing problems. Preferably select the type of printer beforehand as described in chapter 8.1.9 "Setting up the Printer".



5. Click on **OK**.
   The device description is printed out on the selected printer as defined by default.
   If desired, the print layout can be changed individually (see chapter 8.1.7 "Defining the Print Layout").
   A preview prior to printing can also be performed (see chapter 8.1.8 "Previewing the Printout on the Screen").

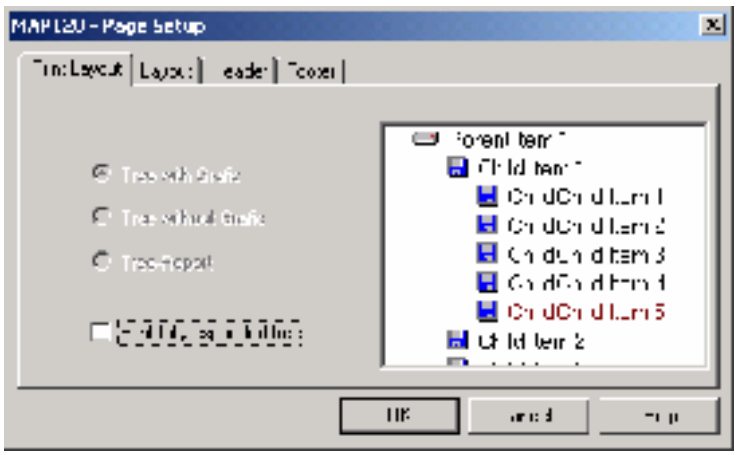
© Landis+Gyr AG

8.1.7 Defining the Print Layout

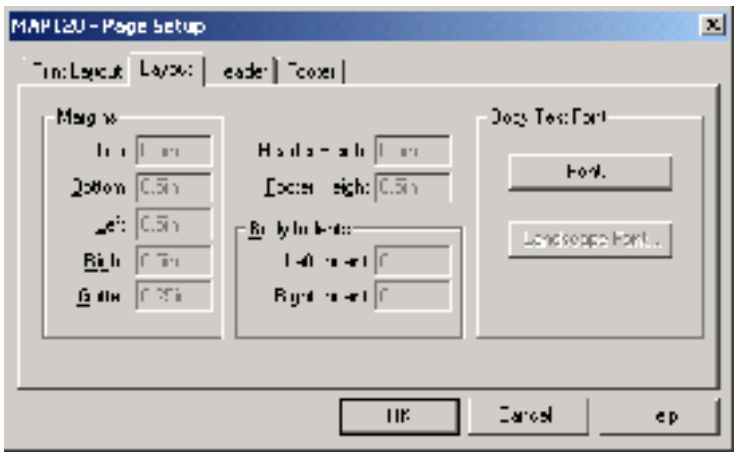
The "Page Setup" function allows you to determine the desired page layout for printouts of a device description.

Procedure:

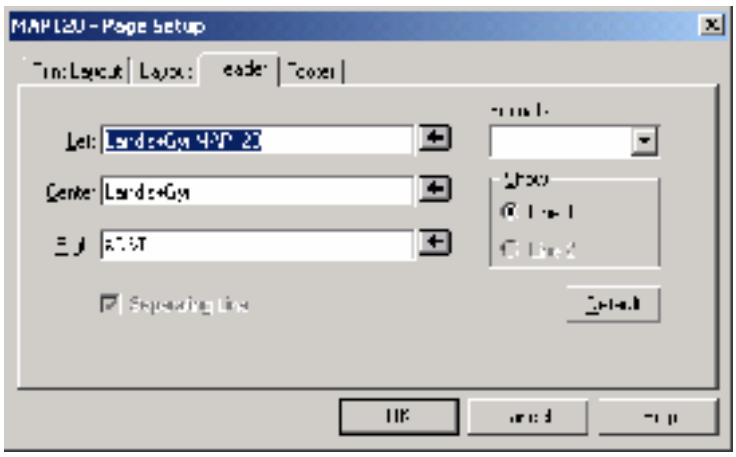
1. Select **Page Setup...** from the **File** menu.
   The "MAP120 - Page Setup" window appears.



2. If you want to printout the fully expanded tree, mark the corresponding check box.
   Otherwise the tree will be printed in the current expansion state.
3. Click on the "Layout" tab.
   A dialog for the layout characteristics is displayed. The margins, the header and footer heights and the body indents cannot be changed.

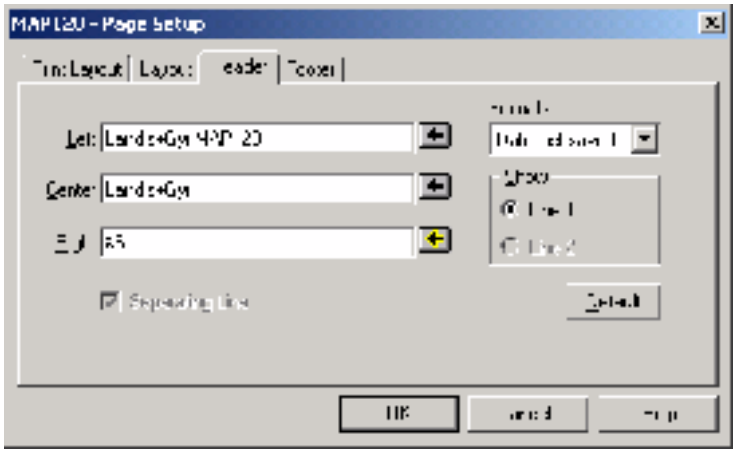


4. Click on **Font...** if you want to set the font according to your wishes.
   The default font is Arial Standard with 10 Pt.
5. Click on the "Header" tab.
   A dialog for the header determination is displayed.



6. Enter the desired header text.
   You may define a left-justified, centered and right-justified header text. The following special text marks will be substituted with actual values where available (or otherwise left blank):
   - Ampersand character (&&)
   - File name (&F)
   - Page number (&P)
   - Total number of pages (&N)
   - Date (&D)
   - Date last saved (&S)
   - Time (&T)
   - Meter type (&Y)
   - Meter manufacturer (&M)

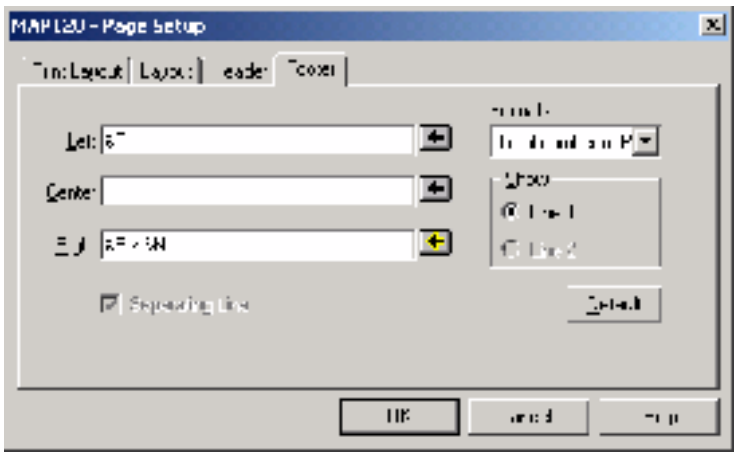
7. In addition or instead of a keyed-in text or special text marks (&) you may insert predetermined formats, selectable in the selection box "Formats", at any position into the text.
   The corresponding special text mark (e.g. &P) is inserted into the entry box as a placeholder after the arrow button beneath the entry box has been clicked on.



8. Click on the "Footer" tab.
   A dialog for the footer determination is displayed.

9. Define the footer in the same way as the header.

© Landis+Gyr AG



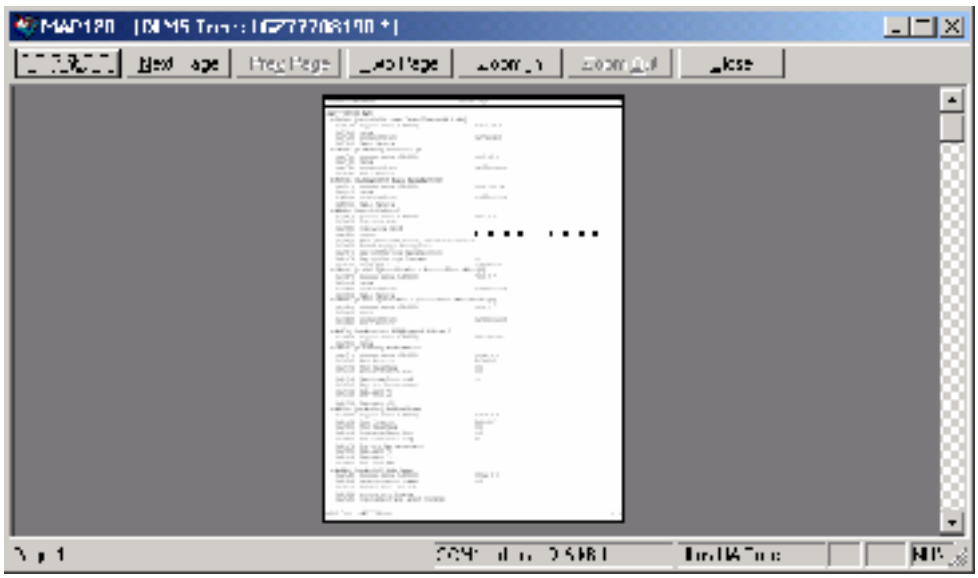
10. Click on **OK**.
    This terminates the page setup for printing. You can now perform a print preview on the screen (see chapter 8.1.8 "Previewing the Printout on the Screen") or start the printout directly (see chapter 8.1.6 "Printing Device Descriptions").

8.1.8 Previewing the Printout on the Screen

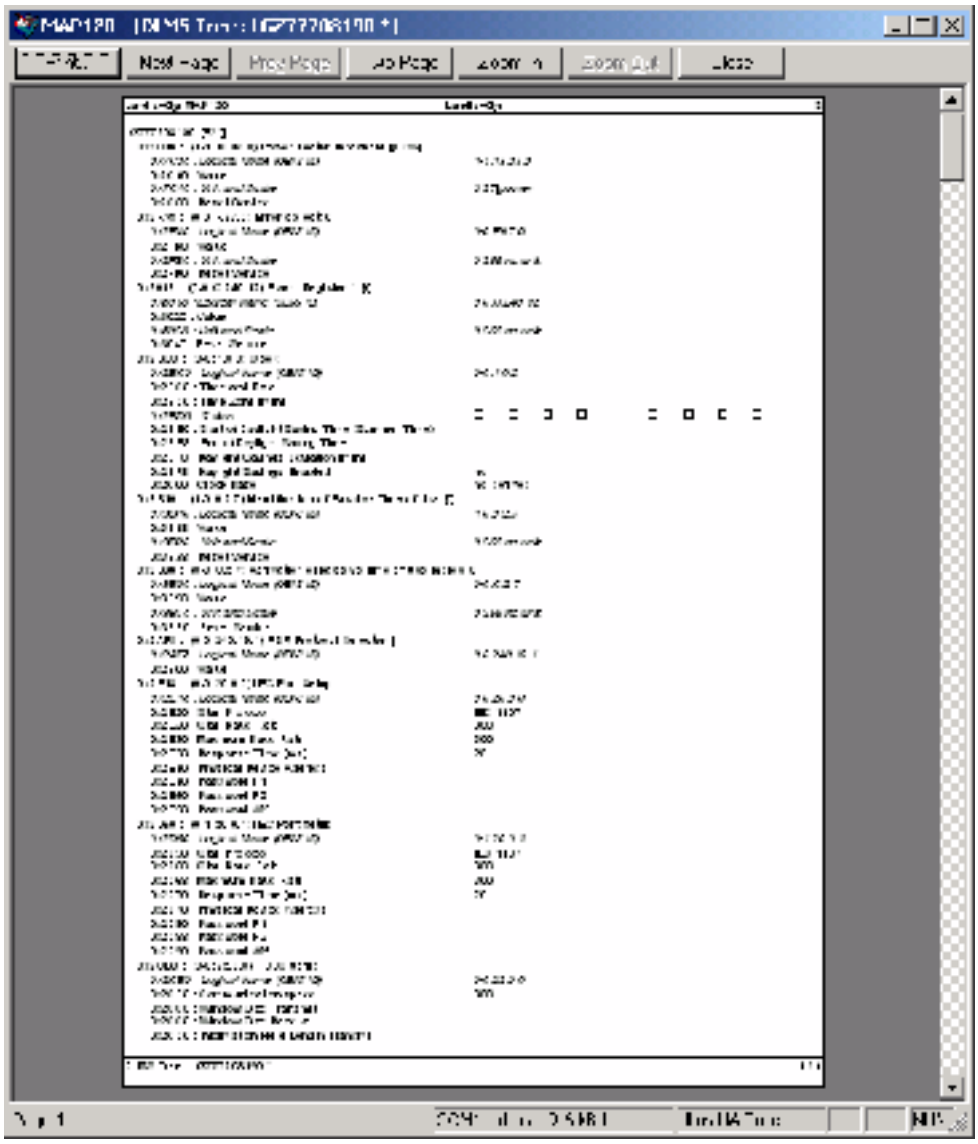
The "Print Preview" function allows you to check the result of the page setup by previewing the printout on the screen prior to printing.

Procedure:

1. Activate the device description window you want to preview on the screen.
2. Expand or collapse the folders as they should appear on the screen.
   To do so click on the corresponding expansion signs ⊞ in the tree.
   If you want to see all items of the tree you can expand the whole tree at once by pressing the "*" key of the numerical keyboard (afterwards you have to scroll up the tree pane to see the root of the tree again).
   If you always want to print the tree fully expanded activate the corresponding check box in the "MAP120 - Page Setup" window (see chapter 8.1.7 "Defining the Print Layout").
3. Select **Print Preview** from the **File** menu.
   The "Print Preview" window appears.



4. Adjust the "Print Preview" window to a suitable size.
   The size of the displayed page is adapted automatically.



The seven buttons offer you the following possibilities, if enabled:

Print... terminates the preview mode and starts the printout.

Next Page advances the print preview to show the next page (or next two pages if in two page mode). The button is disabled if the print preview already shows the last page.

Prev Page changes the print preview to show the previous page (or previous two pages if in two page mode). The button is disabled if the print preview already shows the first page.

Two Page / One Page toggles the display to show one or two full pages at once (it is a toggle button that changes its name from Two Page to One Page and vice versa if pressed). This button is only enabled if the preview does not show a magnified preview.

Zoom In selects the next higher magnification (three magnifications are selectable).

Zoom Out selects the next lower magnification (three magnifications are selectable).

Close terminates the preview mode.

© Landis+Gyr AG

5. Click on **Zoom In** until the size of the print preview representation is sufficient for a check of the details.
   The same effect is achieved by positioning the cursor over the preview document (its shape changes to a magnifying glass) and pressing the left mouse button.

6. If the result does not correspond to your wishes close the print preview and perform the necessary changes in the print setup (see chapter 8.1.7 "Defining the Print Layout" and chapter 8.1.9 "Setting up the Printer").

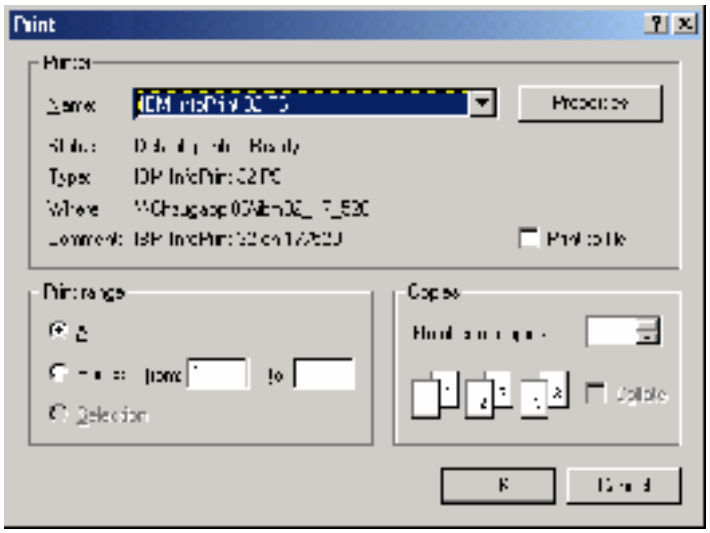
7. Click on **Close**.
   The "Print Preview" window disappears.

8.1.9 Setting up the Printer

The "Print Setup" function is a standard Windows function, which allows you to make the necessary printer settings prior to printing.

Procedure:

1. Select **Print Setup...** from the **File** menu.
   The "Print Setup" window appears (the dialog language depends on the version of your Windows user interface).



2. Make the necessary settings (printer selection, printer properties, paper size, source and orientation).
3. Click on **OK**.
   The new printer settings are stored and will be used for the next printouts.

8.1.10 Terminating the Program

The "Exit" function terminates the Landis+Gyr MAP120 application.

Procedure:

1. Close any open device description windows.
2. Select **Exit** from the **File** menu.
   The application is terminated, the communication is closed and all resources are released.

   If you try to terminate the application, while any device description window with modified and not yet saved data is still open, a security dialog appears, giving you the opportunity to save the corresponding data:

© Landis+Gyr AG

8.2 View Functions

View functions can be called up in the **View** menu.

8.2.1 Expanding and Collapsing Tree Folders

The various functions for expanding and collapsing the tree structure are explained in chapter 6.1 "Survey". Only the functions for selection in the menu are mentioned here.

Procedure:

1. Select **Expand All** from the **View** menu to expand the whole tree below the selected folder (i.e. all subfolders and parameters will be visible).
2. Select **Collapse All** from the **View** menu to collapse the whole tree below the selected folder (i.e. all subfolders and parameters will no longer be visible).

8.2.2 Switching the Toolbar On and Off

The "Toolbar" toggle function enables you to hide or show the toolbar in the main window of the application.

Procedure:

1. Select **Toolbar** from the **View** menu.
   A tick in front of the menu item indicates that the toolbar is currently switched on. After clicking on the menu item the tick in front of it disappears and the toolbar is no longer visible.

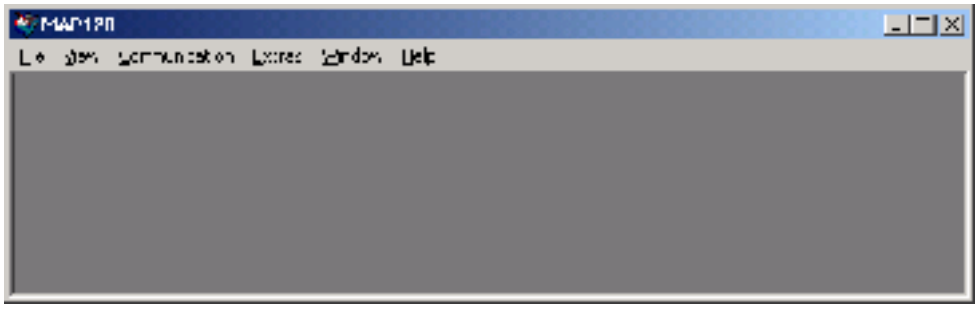
2. Select **Toolbar** again from the **View** menu, if you want to show the toolbar (toggle function).
   No tick in front of the menu item indicates that the toolbar is currently invisible. After clicking on the menu item the tick in front of it reappears and the toolbar is displayed again.

8.2.3 Switching the Message and Status Bar On and Off

The "Status Bar" toggle function enables you to hide or show the message and status bar in the main window of the application.

Procedure:

1. Select **Status Bar** from the **View** menu.
   A tick in front of the menu item indicates that the message and status bar is currently switched on. After clicking on the menu item the tick in front of it disappears and the message and status bar is no longer visible.



2. Select **Status Bar** again from the **View** menu, if you want to show the message and status bar (toggle function).
   No tick in front of the menu item indicates that the message and status bar is currently invisible. After clicking on the menu item the tick in front of it reappears and the message and status bar is displayed again.

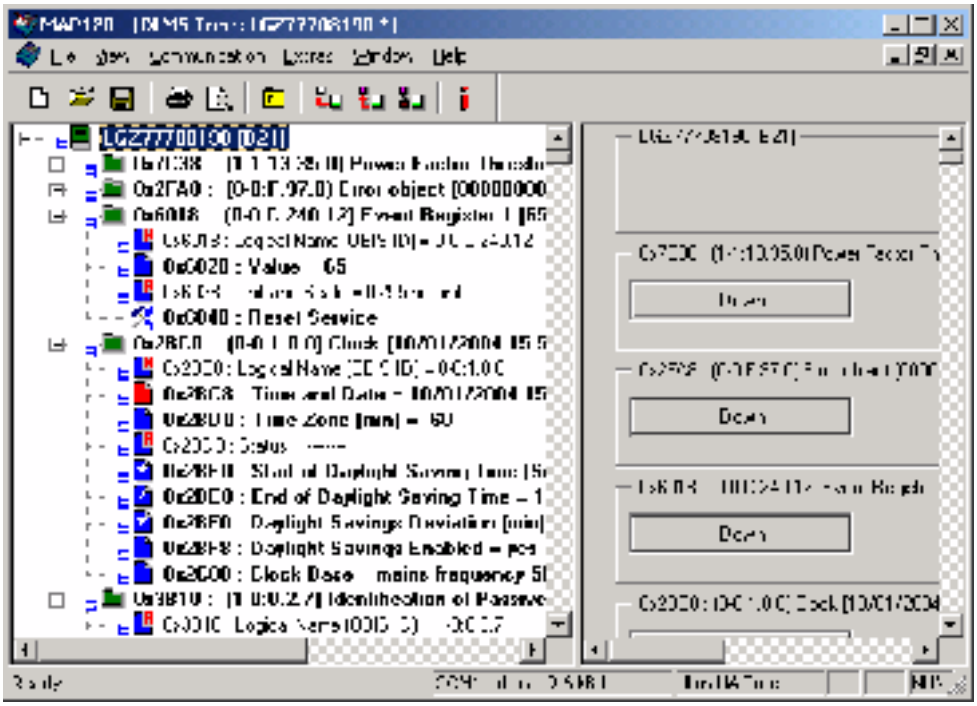
© Landis+Gyr AG

8.2.4 Reset Tree Icons

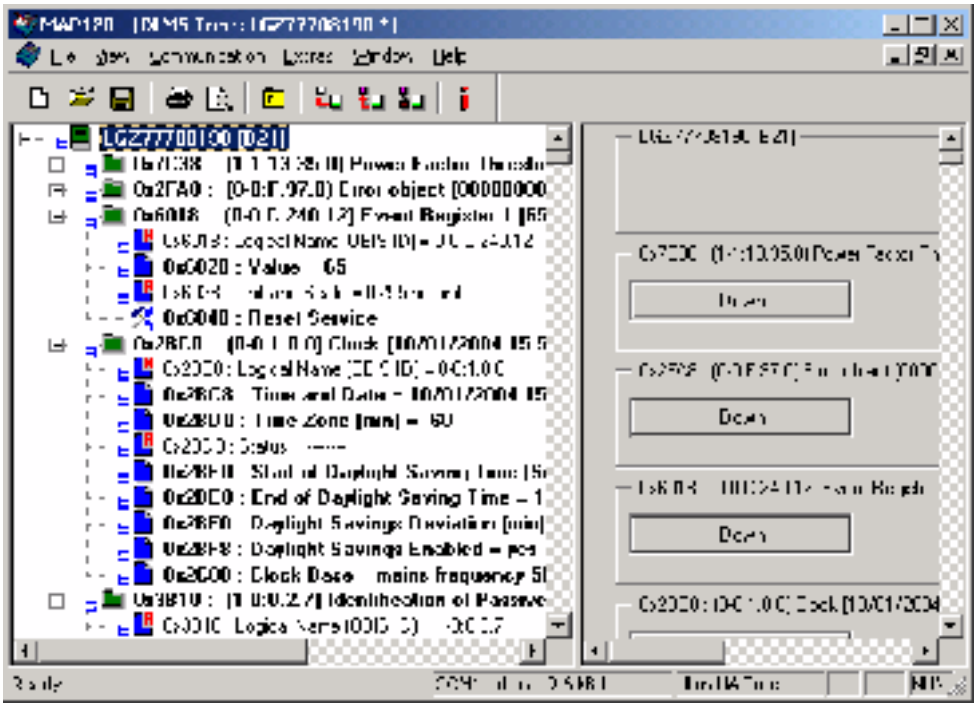
With the "Reset Tree Icon" function you can reset the status colours of all tree items back to the normal representation.

Procedure:

1. Activate the device description window in which you want to reset all tree icons.



2. Select **Reset Tree Icon** from the **View** menu.
   All status colours of the tree items are reset and all asterisks removed.

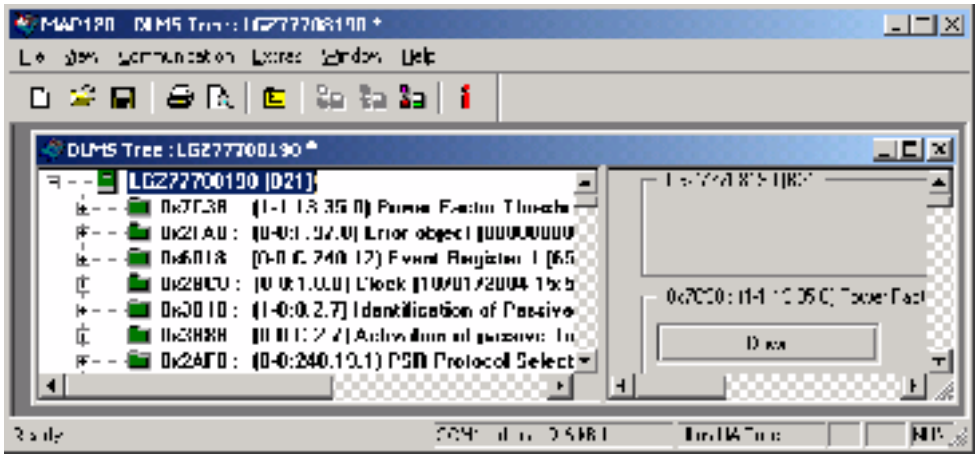


8.2.5 Searching Items

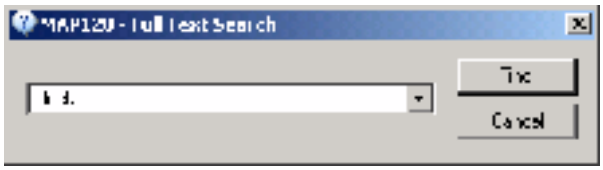
With the "Find" function you can perform a full text search in the whole tree.

Procedure:

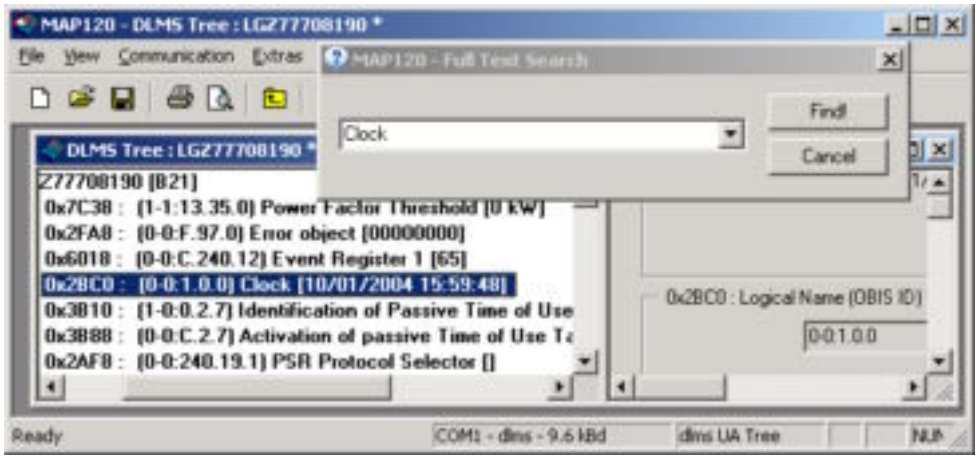
1. Activate the device description window in which you want to search an item.



2. Select **Find...** from the **View** menu.
   The "MAP120 - Full Text Search" window appears. [Ctrl]+[F] has the same effect.
3. Enter the expression you want to find.



4. Click on **Find!**.
   The item with the searched expression is highlighted (the folder containing the item is automatically expanded). If the expression is not contained in the tree a corresponding message is displayed.


MAP120 - DLMS Tree : LGZ77708190 *
File View Communication Extras
MAP120 - Full Text Search
Clock
Find!
Cancel
DLMS Tree : LGZ77708190 *
0x7C38 : (1-1:13.35.0) Power Factor Threshold [0 kW]
0x2FA8 : (0-0:F.97.0) Error object [00000000]
0x6018 : (0-0:C.240.12) Event Register 1 [65]
0x2BC0 : (0-0:1.0.0) Clock [10/01/2004 15:59:48]
0x3810 : (1-0:0.2.7) Identification of Passive Time of Use
0x3888 : (0-0:C.2.7) Activation of passive Time of Use
0x2AF8 : (0-0:240.19.1) PSR Protocol Selector []
0x2BC0 : Logical Name (OBIS ID)
0-0:1.0.0
Ready
COM1 - dlms - 9.6 kBd
dlms UA Tree

5. Click on **Cancel**.
   The "MAP120 - Full Text Search" window disappears.

© Landis+Gyr AG

8.3 Special Functions

Special functions can be called up in the **Extras** menu.

8.3.1 Calling up Licensing Functions

The licensing functions can be called up by selecting **License...** in the **Extras** menu. All licensing functions are fully described in chapter 3 "Licensing".

8.3.2 Specifying General Tool Settings

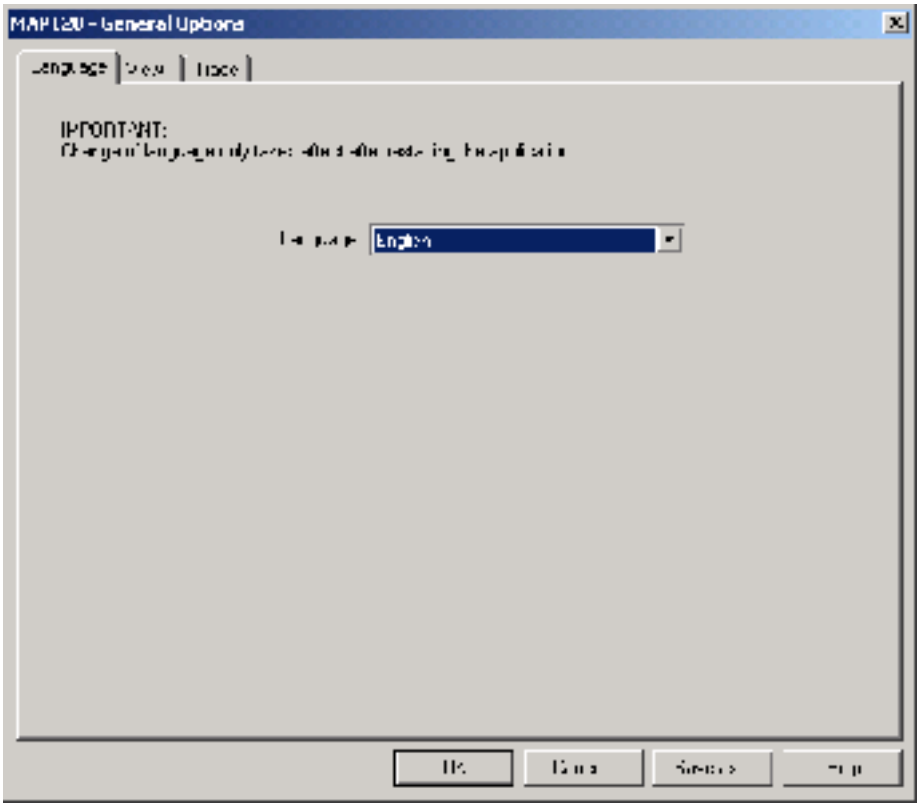
This function allows you to specify the general tool settings such as dialog language, view settings, etc. The possible settings are partly dependent on the license.

Important: Changes to the configuration settings are only effective following a new start of the MAP120 application.

Procedure:

1. Select **Options...** from the **Extras** menu.
   The "MAP120 - General Options" window appears with selected tab "Language".

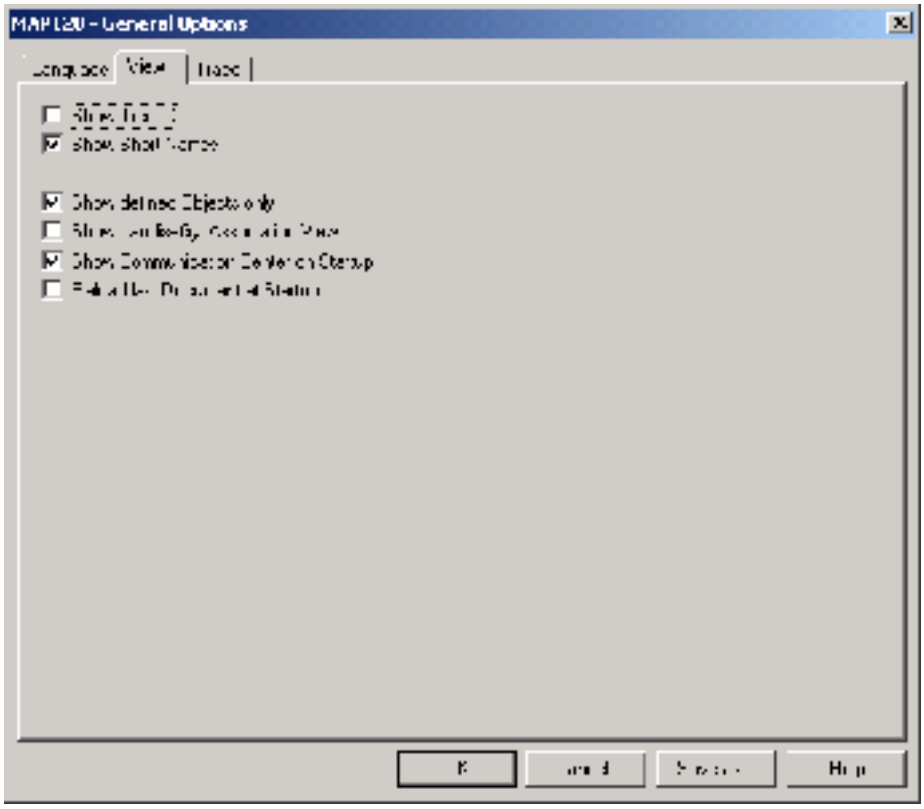
Language selection



2. If the current option settings are to be saved before any change, in order to permit later use if necessary, click on **Save as...** and select the desired place for saving and file name in the window appearing. The settings saved can be re-activated at any time with the "Load Options" function (see chapter 8.3.3 "Reloading Configuration Settings Saved").

3. If you want to change the dialog language for the tool and the tree, select the desired language in the selection box.
   English and German are available.
4. If you want to change view settings click on the corresponding tab. Otherwise continue with point **6**.
   The tab "View" is displayed.

View settings



5. Activate the check boxes for the desired tree representation:
   - "Show Tree ID" displays the five digit identifier number.
   - "Show Short Names" displays the short names, i.e. the corresponding hexadecimal addresses in the meter.
   - "Show defined Objects only" fades out all undefined objects, i.e. registers which are not used in the currently connected meter.
   - "Show Landis+Gyr Association View" displays the trees in the Landis+Gyr view instead of the normal dlms view (can only be used together with Landis+Gyr meters).
   - "Show Communication Center on Startup" displays the "MAP120 - Communication Center" window after each startup. "
   - "Reload last Document at Startup" reloads the last used document automatically after each startup.

   Representation of the various trees is described in chapter 6 "Description of Types of Tree".
6. Click on **OK**.
   The "MAP120 - General Options" window disappears. Close the application and restart it to make the changes effective.

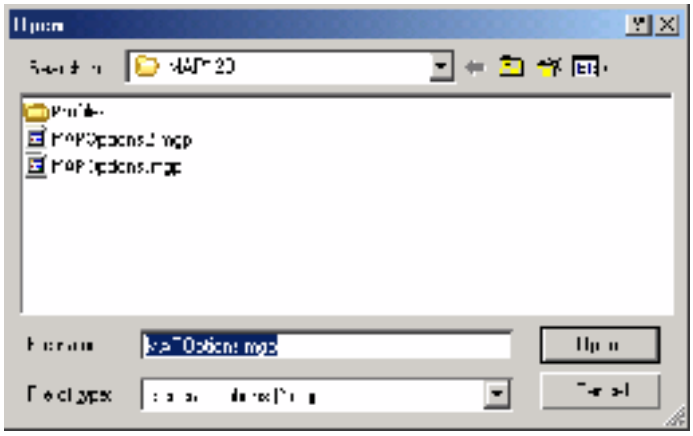
© Landis+Gyr AG

8.3.3 Reloading Configuration Settings Saved

This function enables configuration settings saved to be reloaded.

Procedure:

1. Select **Load Options...** from the **Extras** menu.
   The "Open" window appears (this is an operating system dialog window and therefore the dialog language depends on the version of your Windows user interface).



2. Select the folder with your personal option files in the index structure displayed, if this is not already displayed.
3. Double-click on the desired file name or mark it and then click on **Open**.
   The configuration settings selected are loaded.
4. Close the application and restart it to make the changes effective.

8.4 Window Arrangement Functions

The following functions can be selected in the **Window** menu:

- **New Window**
  Creates a new window that views the same device description.
- **Cascade**
  Arranges windows in an overlapped fashion.
- **Tile**
  Arranges windows in non-overlapped tiles.
- **Arrange Icons**
  Arranges icons of closed windows.

Since these functions are standard Windows functions they will not be explained in more detail at this point. Details are found in the Windows manual belonging to your personal computer.

© Landis+Gyr AG

8.5 Help Functions

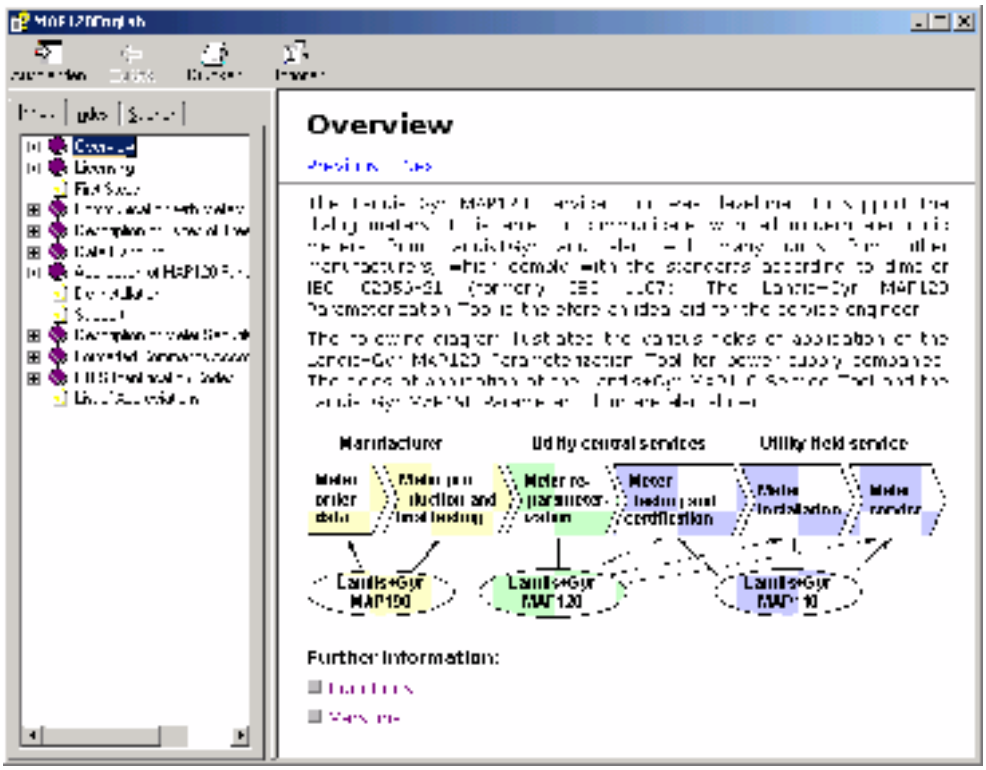
Help functions can be called up in the **Help** menu.

8.5.1 Displaying Help Topics

This function permits access to the help texts for the Landis+Gyr MAP120 Parameterization Tool. These help texts correspond to the contents of this user manual.

Procedure:

1. Select **Help Topics** from the **Help** menu.
   The online help for the Landis+Gyr MAP120 Parameterization Tool appears.



2. Find the desired information.
   Since the help function is a standard Windows function it will not be explained at this point. More details are found in the Windows manual belonging to your personal computer.
3. Click on ☒ to close the online help.

8.5.2 Calling up Context-Sensitive Online Help

The context-sensitive online help can be called up with function key [F1]. The relevant help topic is displayed directly depending on where the focus is set at the time of call-up on the user surface of the Landis+Gyr MAP120 Parameterization Tool. In this case the help text need not be sought yourself via the table of contents or the index.

Tree help

The help texts displayed originate from the contents of the functional description of the relevant meter, if the focus has been set on a tree item of the active device description window.

Tool help

The help texts displayed originate from the contents of the user manual, if the focus has been set on an element of the Landis+Gyr MAP120 Parameterization Tool, e.g. on a dialogue window of the tool.

Example of help topic called up with [F1] if the focus is on the window "MAP120 - Full Text Search".

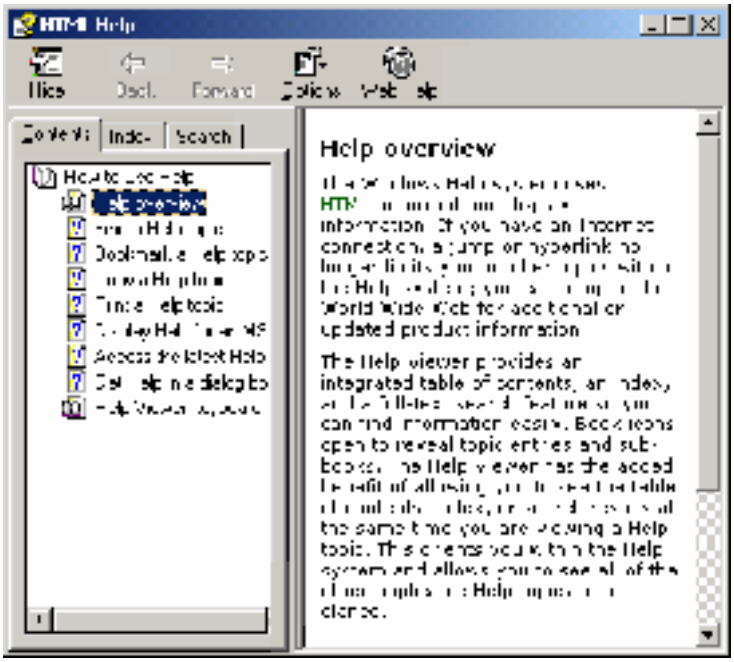
© Landis+Gyr AG

8.5.3 Displaying Help Support

This function provides support for use of online help.

Procedure:

1. Select **How to Use Help** from the **Help** menu.
   A help for the use of the online help appears.



2. Obtain information on the use of online help.
   Since the help function is a standard Windows function it will not be explained at this point. More details are found in the Windows manual belonging to your personal computer.
3. Click on ☒ to close the online help.

8.5.4 Displaying the Current Version of the Program

This function permits the display of information on the current program version.

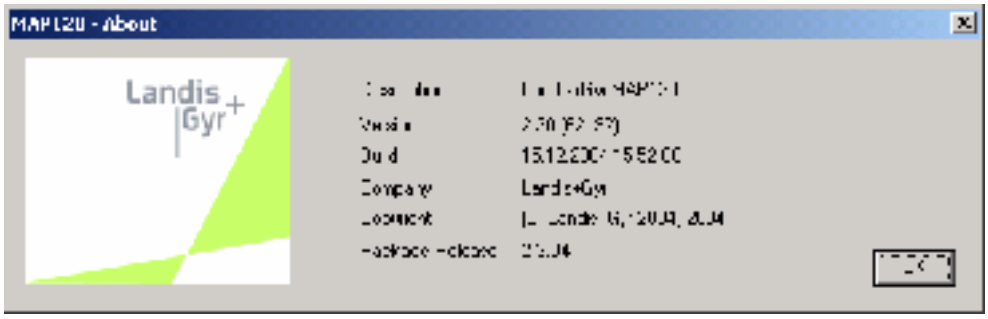
Note

Clear version description is the package release

The current program version is specified as package release (bottom line of information).

Procedure:

1. Click on in the toolbar or select **About...** from the **Help** menu.
   The "MAP120 - About" window appears. It contains information about the current version of the program.



2. Read the information displayed.
3. Click on **OK**.
   The "MAP120 - About" window disappears.

© Landis+Gyr AG

9 De-installation

This chapter describes how to de-install the Landis+Gyr MAP120 Parameterization Tool from the hard disk of your personal computer.

If the Landis+Gyr MAP120 Parameterization Tool is no longer needed, it should be de-installed. To do so, use the de-installation program delivered and installed together with the Landis+Gyr MAP120. Simply deleting the files and directories by means of the Window explorer delete functions does not remove all elements of the program (i.e. entries in the registry and in system files).

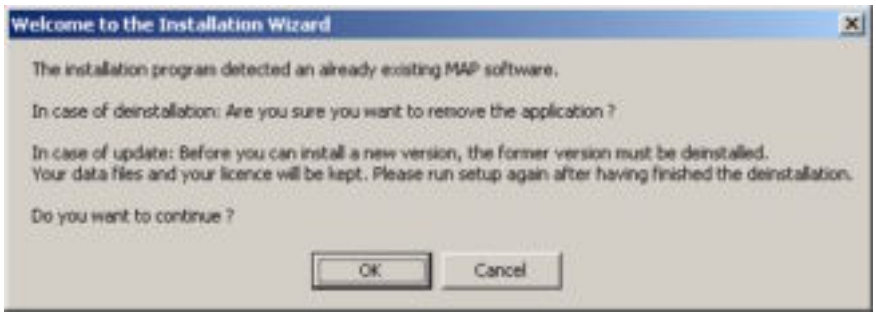
Note

Automatic de-installation of old versions

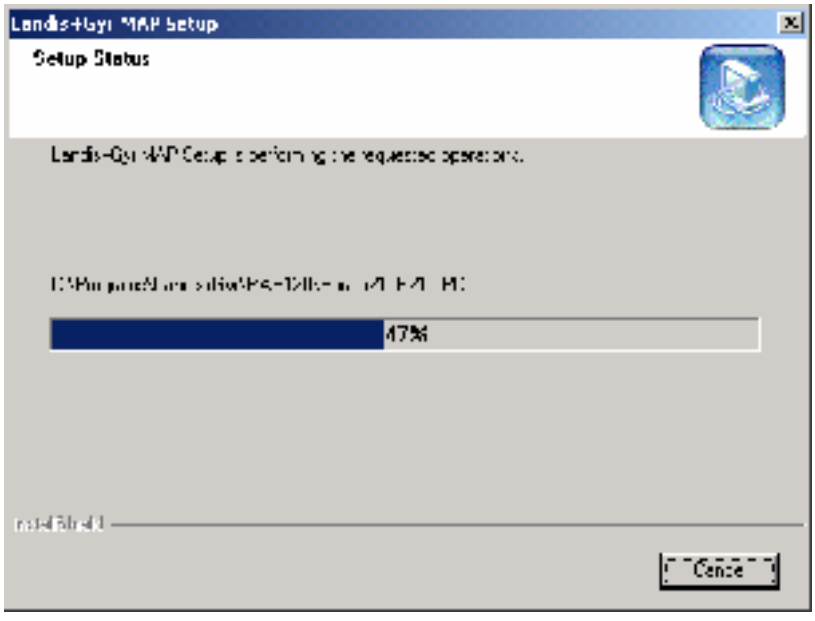
If the Landis+Gyr MAP120 is to be updated with a later version, the old version is de-installed automatically by the installation program.

Procedure:

1. Click on **Start** and then select the **MAP120 UnInstall** command from the menu **Programs**, **Landis+Gyr MAP120**.
   The install shield starts running and asks you first whether you really want to completely remove the program and all of its components.

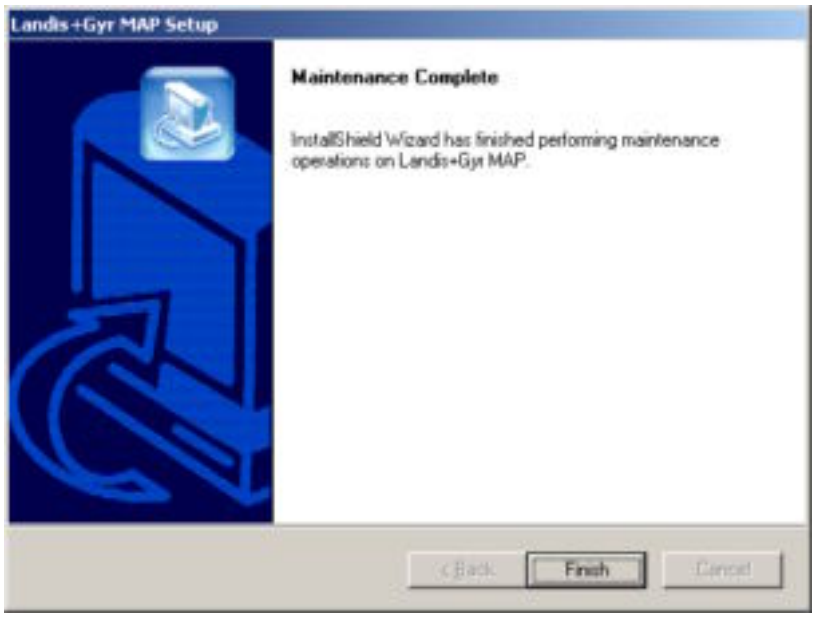

Welcome to the Installation Wizard
The installation program detected an already existing MAP software.
In case of deinstallation: Are you sure you want to remove the application ?
In case of update: Before you can install a new version, the former version must be deinstalled.
Your data files and your licence will be kept. Please run setup again after having finished the deinstallation.
Do you want to continue ?
OK
Cancel

2. Click on **OK**.
   The de-installation is carried out and the progress is reported on the screen.



© Landis+Gyr AG

The successful completion is indicated with the following message.



3. Click on **Finish**.
   The de-installation process is completed. The communication profiles and license stored (if not previously deleted) are retained and are available again for a new installation.

10 Support

The following is designed to help you take the right measure to tackle any problems you may experience when using the Landis+Gyr MAP120 Parameterization Tool.

If a problem arises try to solve it yourself first by applying the following measures:

- Consult the appropriate chapter of this manual
- Call up the context-sensitive help function as described in chapter 8.5.2 "Calling up Context-Sensitive Online Help".
- Read the content of the file README.TXT, supplied with the software.

If these measures do not help, contact your local Landis+Gyr representative.

© Landis+Gyr AG

11 Description of Meter Security System

11.1 Introduction

The data and parameters of Landis+Gyr meters are protected against inadvertent or improper overwriting by a multistage security system.

Note

Security system cannot be changed

The security system must be defined when ordering according to the requirements of the power supply company. It can no longer be altered in the field.

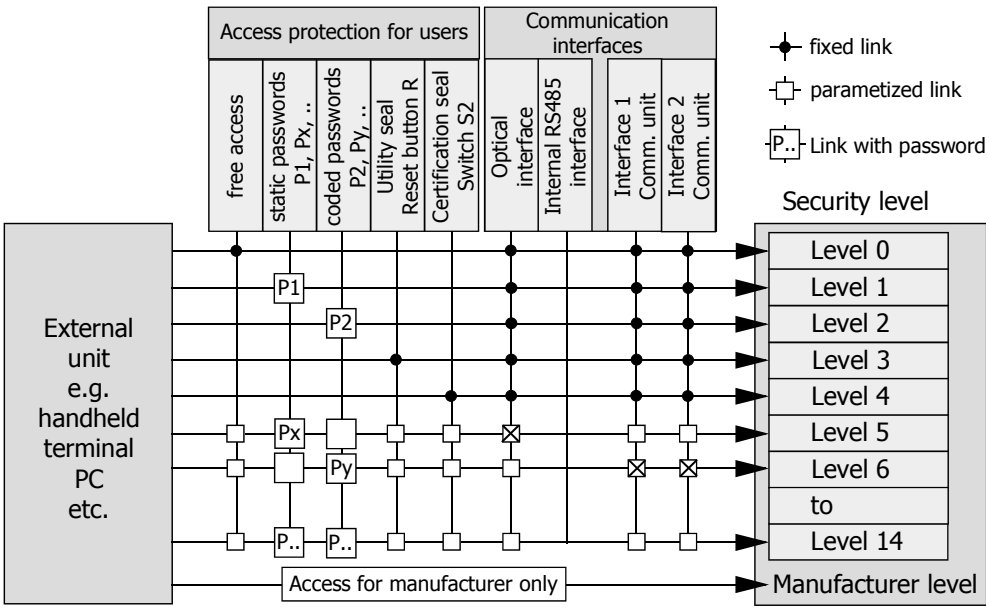
Detailed information on the security system for the relevant meters is provided in the associated functional descriptions.

11.2 Access Levels

The Landis+Gyr meters feature 16 different access levels (level 0 to 9 and A to F) with different access rights each. A distinction is also made between read access and write access. For each register and each parameter, it can be defined which level is required to read and which level is required to write.

All access levels are strictly independent i.e. a higher access level does not automatically bear all rights of the lower access levels.

In order to simplify the handling and to ensure compatibility with former meter families, the security characteristics of all access levels have been partially or completely fixed.



Example for access to the various access levels for the meters ZMD300 and ZxD400

© Landis+Gyr AG

It should be noted when using the dims protocol that access is possible at all levels. If the IEC protocol is used exclusively for communication, only the lower 5 levels are available (level 0 to level 4).

The following security elements can still be selected for some levels:

- Password (if it is used)
- Access via the different communication channels can be enabled or disabled.

11.3 Security Attributes

The meter and the communication unit feature several access levels with different security attributes. For each access level, the security attributes can be defined that must be fulfilled for a successful data access.

Switches protected by the certification seal

Under the main face plate, protected by the certification seal, there is a block of security switches. Their position must be defined in order to gain access to a particular level.

Entering the service menu

It may be defined that access to a certain level will only be granted from the service menu. To enter the service menu the utility seal must be opened.

Passwords

A password may be defined for some access levels. The utility may chose whether a static 8-character password or a coded 7-character password should be used.

Communication channels

The access to a certain level may be restricted so that it is only granted via selected communication channels. Access is for instance possible via the optical interface, the integrated interface and both communication channels of the communication unit.

11.4 Access Levels and their Application

The table below describes all access levels with their security attributes and their typical application. For levels 0 to 4 access is possible via the dlms and IEC protocol, for levels 5 to F only via the dlms protocol.

Level	Security attributes	Access rights / application examples
0 Public Access (IEC and dlms)	without password without breaking a seal	This access level is always available. All dlms meters can be accessed on this level. All data can be read but there is no write access.
1 Data Collection (IEC and dlms)	with static password without breaking a seal	Readout of billing data by means of a handheld terminal or possibly by a central station. All billing data are readable. Limited write access possible, e.g. time/date.
2 Utility Field Service (IEC and dlms)	with coded password without breaking a seal Landis+Gyr Tool required because of coded password	Installation or maintance tasks in the field. All parameters and all billing data are readable. Limited write access to settable data is possible, e.g. device addresses, identification numbers, phone numbers etc.
3 Utility Service (IEC and dlms)	without password breaking the utility seal necessary	Installation or maintenance work in the utility. All parameters and all billing data are readable. Write access to settable data is granted, e.g. battery operating time, switching tables etc.
4 Extended Utility Service (IEC and dlms)	without password breaking the verification seal necessary	Reparameterisation in the utility. All parameters and all billing data are readable. Write access to settable and parameterisable data is granted, e.g register clearing, password setting etc. After the access, a verification is required.
5 Extended Consumer (dlms only)	with static password without breaking a seal	Write access for the end user. All parameters and most billing data are readable. Write access to most user data is granted, e.g. monitor thresholds.
6 Remote Data Collection (dlms only)	with static password without breaking a seal no access via the optical interface	Readout of billing data by a central station. All billing data are readable. Limited write access is possible, e.g. time/date.
7 Remote Service (dlms only)	with static password without breaking a seal no access via the optical interface	Installation or maintenance work in connection with a central station. All parameters and all billing data are readable. Write access to a limited number of settable data is granted, e.g. switching tables, device addresses, identification numbers, phone numbers etc.
8, 9, A, B (dlms only)		Reserved for future expansion.

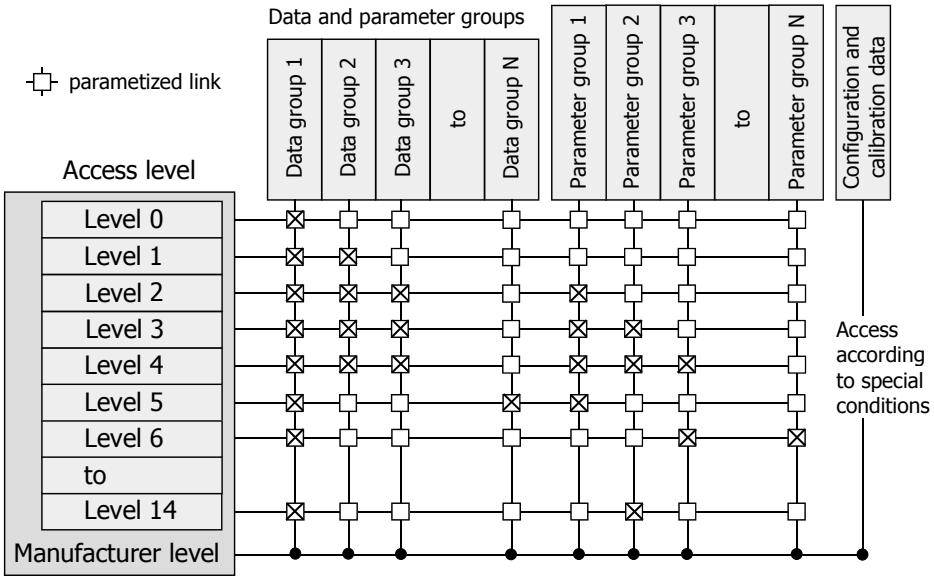
© Landis+Gyr AG

Level	Security attributes	Access rights / application examples
C Read Administrator (dlms only)	with static password without breaking a seal	Allocation of read access rights All parameter and all billing data are readable. Read access rights for all lower levels (0 to B) can be allocated.
D Utility Administrator (dlms only)	with coded password breaking the verification seal necessary access via optical interface only Landis+Gyr Tool required because of coded password	As level 4. In addition, changes in the utility security system are possible: Read and write access rights can be adapted and all passwords can be changed. No access is granted via telemetering systems. After the access, a verification is required.
E Distributor Service (dlms only)	with coded password breaking the verification seal necessary access via optical interface only Landis+Gyr Tool required because of coded password	Service access of the distributor. Identical to level D. In addition, changing the access rights and the password of the utility administrator is possible. No access is granted via telemetering systems. After the access, a verification is required.
F Manufacturer Service (dlms only)	special conditions breaking the verification seal necessary	Extended service access for certified Landis+Gyr service centres. After the access, a verification is required.

11.5 Allocation of Access Rights

In order to simplify the handling of the access rights, all data and parameters have been grouped.

Read and write access rights for the various data and parameter groups can be allocated to the individual access levels.



Example of access rights of the various data and parameter groups

The allocation is defined by the application in the utility and by the national approval regulations. It must be made when ordering the meter, as it cannot be changed later. Details are provided in the functional description for the relevant meter.

© Landis+Gyr AG

12 Formatted Commands According to IEC 62056-21

This chapter describes the formatted commands present in the IEC service tree of the Landis+Gyr MAP120 Parameterization Tool. These commands can be transmitted to all meters (also other makes).

12.1 Definitions

Formatted commands have the following structure:

Command message Code field (Data field)

The data field is only present with write commands.

Examples: the formatted write command **W2 C140 (000000)** sets the battery hours counter to zero. The formatted read command **R2 D000** reads the identification number 1.1 from the meter.

Command message

The following command messages are defined:

Command message	Application
R	IEC data readout
R2	IEC formatted read command
W2	IEC formatted write command (set or reset)
E2	IEC execute command
R4	IEC formatted block read command
W4	IEC formatted block write command
R5	VDEW read command
W5	VDEW write command
R6	VDEW block read command
W6	VDEW block write command

Code field

The code field contains a 4-character hexadecimal code. If the first character of the code is an "F", it is a code specific to the manufacturer, which is not specified in IEC 62056-21, e.g. "FF01" for readout of software version and index.

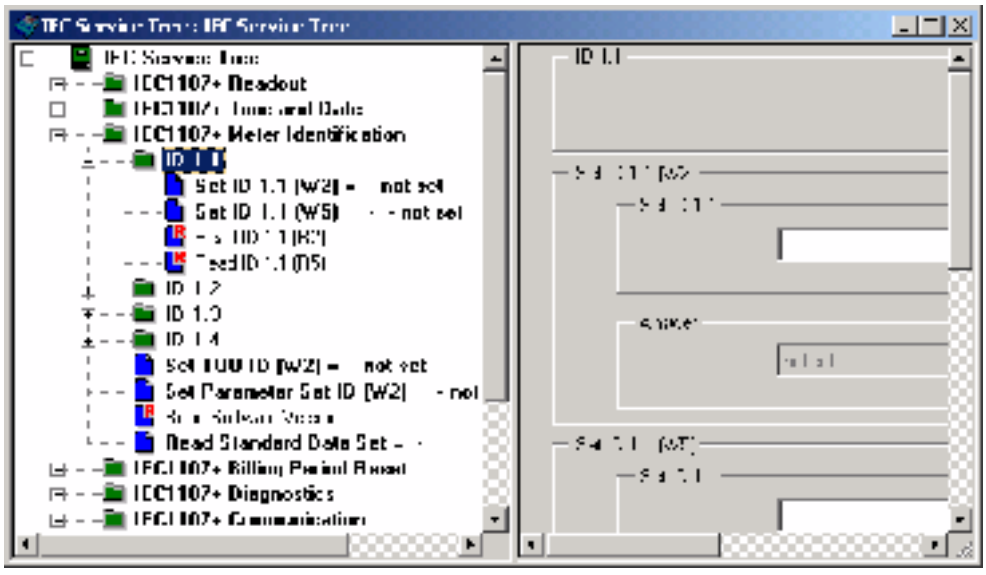
© Landis+Gyr AG

Data field

The following place holders are specified in the command descriptions below if no explicit value is prescribed:

Place holder	Application
n	Numerical character [0..9]. Instead of n another letter can also be used dependent on context (e.g. if various numerical data follow immediately).
nnnnnn	Fixed number (here 6) of numerical characters [000000..999999]
n+	Variable number of numerical characters (equal or less than the maximum size of the register)
z	Status (0=off, 1=on, 9=do not change)
z+	Variable number of states (e.g. 1010 for 4 relays, of which 1 and 3 are to be closed and 2 and 4 opened).
c	Any alphanumerical character
cccc	Fixed number (here 4) of alphanumerical characters, e.g. "1aH7"
c+	Variable number of alphanumerical characters (equal or less than the maximum size of the register)
YY	Year [00..99] This is always only two digits. Values greater than or equal to 96 signify the last century, e.g. 97 for 1997, while values less than 96 mean this century, e.g. 03 for 2003.
MM	Month [01..12]
DD	Day [01..31]
hh	Hour [00..23]
mm	Minute [00..59]
ss	Second [00..59]
ww	Week number [01..53]

Only the data field for write commands must be specified in the IEC service tree of the Landis+Gyr MAP120 Parameterization Tool. It should be entered in the input fields in the right-hand half of the window. The type of command and the code field are permanently programmed in.



12.2 Communication Errors

Communication errors in the execution of IEC commands are reported by Landis+Gyr meters with the following error messages:

Error	Designation	Description
ER0001	Unknown command	Command not implemented or execution impossible (some older meters send this command instead of ER0007).
ER0002	Wrong data field	Command is known but there is an error in the data field.
ER0006	Meter in test mode	This error message is only sent if the meter is in a special test mode and not capable of executing the current command. Can only occur in some ZxB 120/210 meters.
ER0007	Access level insufficient	The required access level for the operation has not been reached.
ER0008	Communication interface busy	Communication busy is set, if parallel communication via more than one interface inhibits initiating a new communication.

12.3 Formatted IEC Commands

Normally all register contents can be read out with the readout command. It is not therefore listed below.

The Landis+Gyr MAP120 Parameterization Tool supports the following formatted IEC commands.

Time and Date

Command	Type	Code	Data field	Remarks
Set time and date	W2	C001	YYMMDDhh mmsswwn	n = day number (1 = Mo ... 7 = Su)
Read time and date	R2	C001		Result has the same format as the data field in the write command
Set time, date and season	W2	C003	YYMMDDhh mmsswwnz	n = day number (1 = Mo ... 7 = Su) z = summer time flag (0 = inactive, 1 = active)
Read time, date and season	R2	C003		Result has the same format as the data field in the write command
Set day and season counter	W2	C002	dddddss	dddd = day counter ss = season counter
Set season 1 length	W2	D010	nnn	
Set season 2 length	W2	D011	nnn	
Set season 3 length	W2	D012	nnn	

© Landis+Gyr AG

	Command	Type	Code	Data field	Remarks
	Set season 4 length	W2	D013	nnn	
	Set season 5 length	W2	D014	nnn	
	Set season 6 length	W2	D015	nnn	
Device identification	Set ID 1.1	W2	D000	n+	
	Read ID 1.1	R2	D000		Result has the same format as the data field in the write command
	Set ID 1.2	W2	D001	n+	
	Read ID 1.2	R2	D001		Result has the same format as the data field in the write command
	Set ID 1.3	W2	D002	n+	
	Read ID 1.3	R2	D002		Result has the same format as the data field in the write command
	Set ID 1.4	W2	D003	n+	
	Read ID 1.4	R2	D003		Result has the same format as the data field in the write command
	Set TOU ID	W2	D00E	n+	
	Set parameter set ID	W2	D00F	n+	
	Read software version	R2	FF01		The result is: VVV.X YY-MM-DD, where V = version number X = index YY-MM-DD = revision date Example: B21.6 03-05-01 The revision date is optional and not supported by all devices.
Reset	Perform cumulation	E2	0001		
	Neutralise cumulation inputs	E2	0003		
	Set cumulation counter	W2	C100	nn	nn = number of cumulations
	Read cumulation counter	R2	C100		Result has the same format as the data field in the write command
Diagnostics	Read error code	R2	C150		
	Reset error code totally	W2	C150		This W2 command only serves to clear the error code. It is not possible to set an error.

	Command	Type	Code	Data field	Remarks
	Reset error code (masked)	W2	C150	n+	In the data field a bitmask can be given to clear only selected bits of the error code. The mask is coded in hexadecimal format. A 1 in the bitmask clears the appropriate error bit. Example: W2 C150 (85): 85 = b01000101, i.e. bit 0, 2 and 6 are cleared.
	Set battery hours counter	W2	C140	nnnnnn	nnnnnn = number of operating hours
	Read battery hours counter	R2	C140		Result has the same format as the data field in the write command
Communication	Set physical IEC device address	W2	D110	n+	
	Read physical IEC device address	R2	D110		Result has the same format as the data field in the write command
	Set communication input signal state	W2	FF05	z+	For each signal an entry is defined. The numbering starts at the rightmost character. Example: W2 FF05 (9011): Set signal 1 and 2 to on, signal 3 to off, do not change signal 4.
Passwords	Set password P1	W2	D108	cccccccc	8 character password
	Set password P2	W2	D117	ccccccc	7 character password
	Set password W5	W2	D118	cccccccc	8 character password
Test mode	Set test mode on	E2	0101		
	Set test mode off	E2	0102		
Energy and demand registers	Reset energy and demand registers	W2	A0F0	0000	
	Reset stored values of energy and demand registers	W2	8000	0005	
Load profile	Reset load profile	W2	9040	0000	
	Read load profile	R2	9040	YYMMDD yymmdd	YYMMDD = start date yymmdd = end date
Enable and disable register on the LCD	Enable register	W2	FF06	nnnn	Virtual hexadecimal name of the register
	Disable register	W2	FF07	nnnn	Virtual hexadecimal name of the register

© Landis+Gyr AG

12.4 Formatted VDEW Commands

For VDEW commands the following additional collective place holders are specified for the data field (see also chapter 12.1 "Definitions"):

Place holder	Format	Remarks
D6	YYMMDD	date
DS7	zYYMMDD	date with season flag
Z4	hhmm	time without seconds
ZS5	zhhmm	time without seconds with season flag
Z6	hhmmss	time
ZS7	zhhmmss	time with season flag
ZST10	YYMMDDhhmm	date and time
ZSTs11	zYYMMDDhhmm	date and time
ZST12	YYMMDDhhmmss	date and time with season flag
ZSTs13	zYYMMDDhhmmss	date and time with seconds and season flag
P8	cccccccc	8 character W5 password
Sn		string (n = number of characters)
In		integer number (n = number of digits)

The season flag has the following meaning: 0 = local normal time, 1 = local daylight saving time, 2 = UTC (GMT).

The Landis+Gyr MAP120 Parameterization Tool supports the following formatted VDEW commands:

	Command	Type	Code*	Data field	Remarks
Time and Date	Set time	W5	0.9.1	ZS7 P8	Season flag is ignored
	Read time	R5	0.9.1		Result has the Z6 format
	Set date	W5	0.9.2	DS7 P8	Season flag is ignored
	Read date	R5	0.9.2		Result has the Z6 format
Device identification	Set ID 1.1	W5	0.0.0	I8 P8	
	Read ID 1.1	R5	0.0.0		Result has the same format as the data field in the write command (without password)
	Set ID 1.2	W5	0.0.1	I8 P8	
	Read ID 1.2	R5	0.0.1		Result has the same format as the data field in the write command (without password)
	Set ID 1.3	W5	0.0.2	I8 P8	
	Read ID 1.3	R5	0.0.2		Result has the same format as the data field in the write command (without password)

	Command	Type	Code*	Data field	Remarks
	Set ID 1.4	W5	0.0.3	I8 P8	
	Read ID 1.4	R5	0.0.3		Result has the same format as the data field in the write command (without password)
	Read standard data set identifier	R5	C.99.8		Result has the format S8 containing the standard data set identifier of the IEC readout.
Load profile	Reset load profile	W5	P.01	; P8	
	Read load profile	R5	P.01	Start time; end time KZ1..KZn P8	The load profile between start and end time is given out (if one of the two items is missing, the profile is read from the first entry or up to the last). Supported formats for start and end time: ZST10, ZSTs11, ZST12, ZSTs13. KZ = EDIS code (optional) for readout of the requested elements (without code, all elements are provided). P8 (optional): If the use of W5 password for reading is parameterised, the password is expected in the request. The result is provided according to the VDEW definitions. The timestamp format is parameterised (ZSTs11 or ZSTs13).
	Block read load profile	R6	P.01	Start time; end time KZ1..KZn P8	See R5 command. n = number of profile entries for a readout block (without entry, the maximum range is taken).
Event log	Reset event log	W5	P.98	; P8	
	Read event log	R5	P.98	Start time; end time KZ1..KZn P8	See corresponding load profile command.
	Block read event log	R6	P.98	Start time; end time KZ1..KZn P8	See corresponding load profile command.

** Landis+Gyr meters have an identification number system with parameter setting. It must be ensured that the code in the command corresponds to that in the unit.*

© Landis+Gyr AG

13 OBIS Identification Codes

13.1 General Description

For OBIS (Object Identification System) the structure **A-B:C.D.E.F** applies, whereby the individual groups have the following significance:

A Defines the characteristic of the data item to be identified, e.g. abstract data, electricity-, gas-, heat- or water-related data.

B Defines the channel number, i.e. the number of the input of a metering equipment having several inputs for the measurement of energy of the same or different types (e.g. in data concentrators, registration units). This enables data from different sources to be identified.

C Defines the abstract or physical data items related to the information source concerned, e.g. active power, reactive power, apparent power, cos φ, current or voltage.

D Defines types, or the result of the processing of physical quantities according to various specific algorithms. The algorithms can deliver energy and demand quantities as well as other physical quantities.

E Defines the further processing of measurement results to tariff registers, according to the tariffs in use. For abstract data or for measurement results for which tariffs are not relevant, this value group can be used for further classification.

F Defines the storage of data according to different billing periods. Where this is not relevant, this value group can be used for further classification.

To simplify the reading in the index field, individual groups of the OBIS code can be omitted. The abstract or physical data C and type of data D must be shown. **A full specification of the OBIS identification number system can be found in standard IEC 62056-61.**

Only the values of interest to meters are explained below with a collection of examples.

Group A

Group A of the OBIS identification can theoretically have values in the range between 0 and 15. Only the values
0 (abstract objects) and
1 (electricity related objects)
appear in the Landis+Gyr MAP120 Parameterization Tool.

Group B

Group B of the OBIS identification can theoretically have values in the range between 0 and 255. Only the values
0 (no channel specified)
1 (channel 1) and
2 (channel 2)
appear in the Landis+Gyr MAP120 Parameterization Tool.

© Landis+Gyr AG

Group C

Group C of the OBIS identification can have values in the range between 0 and 255. The individual values are differently assigned depending on the value of group A. The values for abstract items (group A = 0) are of no interest at this point, since they are largely specific to either context, country or manufacturer. On the other hand, the values for items related to electricity are listed in the following table.

Value	Application
0	General purpose objects
1	Sum of all phases: active energy import (+A)
2	Sum of all phases: active energy export (-A)
3	Sum of all phases: reactive energy import (+R)
4	Sum of all phases: reactive energy export (-R)
5	Sum of all phases: reactive energy quadrant I (+Ri)
6	Sum of all phases: reactive energy quadrant II (-Rc)
7	Sum of all phases: reactive energy quadrant III (-Ri)
8	Sum of all phases: reactive energy quadrant IV (+Rc)
9	Sum of all phases: apparent energy import (+S)
10	Sum of all phases: apparent energy export (-S)
11	Any phase: current
12	Any phase: voltage
13	Average power factor ($\cos\varphi$)
14	Mains frequency (fn)
15	Sum of all phases: active energy quadrant I+IV+II+III
16	Sum of all phases: active energy quadrant I+IV-II-III
17	Sum of all phases: active energy quadrant I
18	Sum of all phases: active energy quadrant II
19	Sum of all phases: active energy quadrant III
20	Sum of all phases: active energy quadrant IV
21	Phase 1: active energy import
22	Phase 1: active energy export
23	Phase 1: reactive energy import
24	Phase 1: reactive energy export
25	Phase 1: reactive energy quadrant I
26	Phase 1: reactive energy quadrant II
27	Phase 1: reactive energy quadrant III
28	Phase 1: reactive energy quadrant IV
29	Phase 1: apparent energy import
30	Phase 1: apparent energy export
31	Phase 1: current
32	Phase 1: voltage

Value	Application
33	Phase 1: power factor
34	Phase 1: frequency
35	Phase 1: active energy quadrant I+IV+II+III
36	Phase 1: active energy quadrant I+IV-II-III
37	Phase 1: quadrant I
38	Phase 1: quadrant II
39	Phase 1: quadrant III
40	Phase 1: quadrant IV
41…60	Phase 2: same as 21…40
61…80	Phase 3: same as 21…40
81	Phase angles
82	Unitless quantity (pulses or pieces)
83...90	Not used
91	Neutral: current
92	Neutral: voltage
93...95	Not used
96	Electricity-related service entries
97	Electricity-related error messages
98	Electricity-related list objects
99	Data profiles
100...127	Reserved
128...254	Manufacturer-specific definitions Landis+Gyr: 130 = Sum of all phases: reactive energy quadrant I+IV+II+III 131 = Sum of all phases: reactive energy quadrant I+II-III-IV 132 = Sum of all phases: reactive energy quadrant I+IV 133 = Sum of all phases: reactive energy quadrant II+III 150 = Phase 1: reactive energy quadrant I+IV+II+III 151 = Phase 1: reactive energy quadrant I+II-III-IV 152 = Phase 1: reactive energy quadrant I+IV 153 = Phase 1: reactive energy quadrant II+III 170 = Phase 2: reactive energy quadrant I+IV+II+III 171 = Phase 2: reactive energy quadrant I+II-III-IV 172 = Phase 2: reactive energy quadrant I+IV 173 = Phase 2: reactive energy quadrant II+III 190 = Phase 3: reactive energy quadrant I+IV+II+III 191 = Phase 3: reactive energy quadrant I+II-III-IV 192 = Phase 3: reactive energy quadrant I+IV 193 = Phase 3: reactive energy quadrant II+III
255	Reserved

© Landis+Gyr AG

Group D Group D of the OBIS identification can have values in the range between 0 and 255. The individual values are differently assigned depending on the value of group A and C, but are not described here.

Group E Group E of the OBIS identification can have values in the range between 0 and 255. In the Landis+Gyr MAP120 Parameterization Tool for group E for electricity-related items (group A = 1) the values corresponding to the number of tariffs specified mainly appear (0 = total of all tariffs, 1 = tariff 1, 2 = tariff 2, etc.). Other values apply for specific values of group C, but these are not described here.

Group F Group F of the OBIS identification can have values in the range between 0 and 255. In the Landis+Gyr MAP120 Parameterization Tool group F is not used and is therefore always set to 255.

13.2 Examples

The following table shows a selection of OBIS identification numbers and explains their significance.

OBIS code (decimal)	OBIS code (hex)						Description
	A	B	C	D	E	F	
0-0:1.0.0	00	00	01	00	00	FF	Clock
0-0:42.0.0	00	00	2A	00	00	FF	dlms device identification
0-0:C.1.0	00	00	60	01	00	FF	Identification number 2.1
0-0:C.1.1	00	00	60	01	01	FF	Identification number 2.2
0-0:C.2.0	00	00	60	02	00	FF	Number of parameterisations
0-0:C.2.1	00	00	60	02	01	FF	Date and time of last parameterisation
0-0:C.2.2	00	00	60	02	02	FF	Activation date TOU
0-0:C.2.3	00	00	60	02	03	FF	Date of last RCR program change
0-0:C.240.0	00	00	60	F0	00	FF	EEPROM identification
0-0:C.240.13	00	00	60	F0	0D	FF	Hardware ID
0-0:C.3.1	00	00	60	03	01	FF	Input terminal states base meter
0-0:C.3.2	00	00	60	03	02	FF	Output terminal states base meter
0-0:C.4.0	00	00	60	04	00	FF	Internal control signal states
0-0:C.5.0	00	00	60	05	00	FF	Internal operating state
0-0:C.6.0	00	00	60	06	00	FF	Operating time of battery
0-0:C.6.3	00	00	60	06	03	FF	Battery voltage
0-0:C.7.0	00	00	60	07	00	FF	Number of phase fails L1..L3
0-0:C.7.1	00	00	60	07	01	FF	Number of phase fails L1
0-0:C.7.2	00	00	60	07	02	FF	Number of phase fails L2
0-0:C.7.3	00	00	60	07	03	FF	Number of phase fails L3
0-0:C.8.0	00	00	60	08	00	FF	Total operating time
0-0:C.8.t	00	00	60	08	t	FF	Operating time (t = tariff number)

OBIS code (decimal)	OBIS code (hex)						Description
	A	B	C	D	E	F	
0-0:C.90	00	00	60	5A	FF	FF	Configuration ID
0-0:C.90.1	00	00	60	5A	01	FF	Physical IEC device address
0-0:C.90.2	00	00	60	5A	02	FF	Physical HDLC device address
1-0:C.2.7	00	00	60	02	07	FF	Activation date passive TOU
0-0:F.F.0	00	00	61	61	00	FF	Error code register
0-0:L.1.0*126	00	00	62	01	00	7E	Stored values
0-0:240.1.0	00	00	F0	01	00	FF	Meter functions
0-1:C.2.5	00	01	60	02	05	FF	Date and time of last calibration
0-1:C.240.8	00	01	60	F0	08	FF	Hardware ID of base meter
0-1:C.3.1	00	01	60	03	01	FF	Input terminal states extension board
0-1:C.3.2	00	01	60	03	02	FF	Output terminal states extension board
0-2:C.240.8	00	02	60	F0	08	FF	Hardware ID of extension board
0-2:C.240.9	00	02	60	F0	09	FF	Reference hardware ID of extension board
1-0:0.0.1	01	00	00	00	00	FF	Identification number 1.1
1-0:0.0.2	01	00	00	00	01	FF	Identification number 1.2
1-0:0.0.3	01	00	00	00	02	FF	Identification number 1.3
1-0:0.0.4	01	00	00	00	03	FF	Identification number 1.4
1-0:0.1.0	01	00	00	01	00	FF	Reset counter
1-0:0.1.2	01	00	00	01	02	FF	Time and date of last billing period reset
1-0:0.2.0	01	00	00	02	00	FF	Software ID
1-0:0.2.1	01	00	00	02	01	FF	Parameterisation ID
1-0:0.2.3	01	00	00	02	03	FF	Ripple control receiver ID
1-0:0.2.4	01	00	00	02	04	FF	Connection ID
1-0:0.2.7	01	00	00	02	07	FF	Passive TOU ID
1-0:0.9.5	01	00	00	09	05	FF	Weekday
1-0:C.99.8	01	00	60	69	08	FF	Display and IEC readout ID
1-0:P.1.0	01	00	63	01	00	FF	Load profile
1-0:P.98.0	01	00	63	62	00	FF	Event log
1-1:0.3.0	01	01	00	03	00	FF	Meter constant active energy
1-1:0.3.1	01	01	00	03	01	FF	Meter constant reactive energy
1-1:0.4.0	01	01	00	04	00	FF	Scale factor for demand display
1-1:0.4.1	01	01	00	04	01	FF	Scale factor for energy display
1-1:0.4.2	01	01	00	04	02	FF	Current transformer ratio
1-1:0.4.3	01	01	00	04	03	FF	Voltage transformer ratio
1-1:13.0.0	01	01	0D	00	00	FF	Average billing period power factor

© Landis+Gyr AG

OBIS code (decimal)	OBIS code (hex)						Description
	A	B	C	D	E	F	
1-1:13.3.n	01	01	0D	03	n	FF	Power factor minimum (n = number)
1-1:13.31.n	01	01	0D	23	n	FF	Power factor threshold (n = number)
1-1:13.35.n	01	01	0D	23	n	FF	Power factor monitor threshold (n = number)
1-1:13.5.0	01	01	0D	00	00	FF	Last average power factor
1-1:13.7.0	01	01	0D	07	00	FF	Total power factor
1-1:14.7.0	01	01	0E	07	00	FF	Mains frequency
1-1:16.7.0	01	01	10	07	00	FF	Active energy
1-1:31.7.0	01	01	1F	07	00	FF	Current L1
1-1:31.35.0	01	01	1F	23	00	FF	Overcurrent threshold L1
1-1:32.7.0	01	01	20	07	00	FF	Voltage L1
1-1:32.31.0	01	01	20	1F	00	FF	Undervoltage threshold L1
1-1:32.35.0	01	01	20	23	00	FF	Overvoltage threshold L1
1-1:33.7.0	01	01	21	07	00	FF	Power factor L1
1-1:51.7.0	01	01	33	07	00	FF	Current L2
1-1:51.35.0	01	01	33	23	00	FF	Overcurrent threshold L2
1-1:52.7.0	01	01	34	07	00	FF	Voltage L2
1-1:52.31.0	01	01	34	1F	00	FF	Undervoltage threshold L2
1-1:52.35.0	01	01	34	23	00	FF	Overvoltage threshold L2
1-1:53.7.0	01	01	35	07	00	FF	Power Factor L2
1-1:71.7.0	01	01	47	07	00	FF	Current L3
1-1:71.35.0	01	01	47	23	00	FF	Overcurrent threshold L3
1-1:72.7.0	01	01	48	07	00	FF	Voltage L3
1-1:72.31.0	01	01	48	1F	00	FF	Undervoltage threshold L3
1-1:72.35.0	01	01	48	23	00	FF	Overvoltage threshold L3
1-1:73.7.0	01	01	49	07	00	FF	Power Factor L3
1-1:81.7.0	01	01	51	07	00	FF	Angle U(L1) to U(L1)
1-1:81.7.1	01	01	51	07	01	FF	Angle U(L2) to U(L1)
1-1:81.7.2	01	01	51	07	02	FF	Angle U(L3) to U(L1)
1-1:81.7.3	01	01	51	07	04	FF	Angle I(L1) to U(L1)
1-1:81.7.4	01	01	51	07	05	FF	Angle I(L2) to U(L1)
1-1:81.7.5	01	01	51	07	06	FF	Angle I(L3) to U(L1)
1-1:91.7.0	01	01	5B	07	00	FF	Neutral current
1-1:91.35.0	01	01	5B	23	00	FF	Overcurrent threshold N
1-1:131.7.0	01	01	83	07	00	FF	Reactive energy
1-1:m.2.0	01	01	m	02	00	FF	Cumulative maximum demand (m = measured quantity)

OBIS code (decimal)	OBIS code (hex)						Description
	A	B	C	D	E	F	
1-1:m.4.0	01	01	m	04	00	FF	Current average demand (m = measured quantity)
1-1:m.6.t	01	01	m	06	t	FF	Maximum demand register (m = measured quantity, t = tariff number)
1-1:m.8.0	01	01	m	08	00	FF	Total energy register (m = measured quantity)
1-1:m.8.t	01	01	m	08	t	FF	Energy register (cumulative) (m = measured quantity, t = tariff number)
1-1:m.9.t	01	01	m	09	t	FF	Energy register (billing period delta value) (m = measured quantity, t = tariff number)
1-1:m.29.t	01	01	m	1D	t	FF	Energy register (registration period delta value) (m = measured quantity, t = tariff number)
1-1:m.35.n	01	01	m	23	n	FF	Demand register monitor threshold (m = measured quantity, n = number)
1-2:82.8.0	01	02	52	08	00	FF	Counter S0 pulses input 1
1-3:82.8.0	01	03	52	08	00	FF	Counter S0 pulses input 2
a-2:m.8.0	a	02	m	08	00	FF	External pulse input 1 (a = medium, m = measured quantity)
a-3:m.8.0	a	03	m	08	00	FF	External pulse input 2 (a = medium, m = measured quantity)

© Landis+Gyr AG

14 List of Abbreviations

This chapter explains abbreviations used in this user manual or on dialog windows of the Landis+Gyr MAP120 application in alphabetical order.

Abbreviation	Definition Description
COSEM	**Companion Specification for Energy Metering** Comprises the specifications required in addition to dlms (as defined in IEC 61334-4-41, 1996), which describe the interface to the meter. These are namely the standards (drafts) IEC 62056-42, IEC 62056-46, IEC 62056-53, IEC 62056-61 and IEC 62056-62.
dlms	**Distribution Line Message Specification** Messaging system defined originally as part of the application layer of the protocol stack for distribution line carrier systems (IEC 61334-4-41, 1996). Its universality and its independence of the actual communication channel allowed dlms to become the choice of the metering industry for any metering application (Device Language Message Specification).
dlms UA	**dlms User Association** Group of different companies interested in promoting, developing and enhancing the dlms standard.
FDC	**Landis+Gyr product designation** The FDC1.3 is an adapter developed from Landis+Gyr for the conversion of serial RS232 interfaces to optical interfaces according to IEC 62056-21 (reading head TVS9).
GMT	**Greenwich Mean Time** Time zone
GSM	**Global System for Mobile communications** Wireless communication network for data and voice transmission.
HDLC	**High Level Data Link Control** Communication protocol used by COSEM (IEC 62056-46), specifying the data link layer. The HDLC standard is ISO/IEC 13239, 2000 (second edition). Some older COSEM implementations rely on the first, 1996 edition of the standard.
IEC	**International Electrotechnical Commission** IEC 62056-21 is the standard "Electricity metering - Data exchange for meter reading, tariff and load control - Part 21: Direct local data exchange". This is the third edition of the formerly well-known standard IEC 61107 (IEC 1107).

© Landis+Gyr AG

MAC	**Medium Access Control** MAC specifies the link layer address of the device for the communication. COSEM separates the address in a lower MAC address (addressing the physical device) and an upper MAC address (addressing the logical device within the physical device).
MAP	**Meter Application Product** The MAP software tools have been developed and distributed by Landis+Gyr to support electricity meters. This group of tools comprises the MAP 190 Parameterisation Editor Tool and the MAP120 Parameterization Tool.
OBIS	**Object Identification System** Identification number system for clear identification of dlms items.
PSTN	**Public Switched Telephone Network** The public switched telephone network can be used for data transmission. To this purpose a modem (modulator/demodulator) must be inserted between computer and telephone network and also between the telephone network and the remote meter.
SAP	**Service Access Point** The SAP is a device address defined in the link layer (see HDLC). Only a correctly addressed device reacts to the communication data received.
UTC	**Universal Time Conversion** UTC corresponds to GMT.
VDEW	**Vereinigung Deutscher Elektrizitätswerke** VDEW is the central organisation of the German electrical industry. It combines and represents the interests of its members and is consultant and forward-looking body for energy questions (refer also to www.strom.de).

15 Index

Access levels 26, 101
Addressing meters 27
Advanced communication settings 25
Allocation of the data and parameter groups 105
Baud rate 26
Billing values and profiles 50
Bit assignment in error status word 67
Calling up context-sensitive online help 93
Certification feature 56
Closing device description windows 75
Collapsing tree folders 84
Command message 107
Communication center 21
Communication errors during execution of IEC commands 109
Communication examples 28
Communication profiles 22
Communication unit 42
Communication with meters 21
Comparing parameterisation tree to file 57
Comparing parameterisation tree to meter 59
Comparison with a file 57
Comparison with a meter 59
Conditions for the use of this user manual 3
Conventions 3
COSEM 123
Creating new device descriptions 71
Current version of the program 95
Data export 65, 68, 69
Data selection for load profile readout 66
Default passwords 35
Defining the print layout 78
De-installation 97
Demo version 10
Device address 27
Device description generation 71
Device description windows 44
Direct connection 24
Displaying help topics 92
dlms 123
dlms tree 45
dlms tree Landis+Gyr view 46
dlms tree normal view 45
Entering license data 16
Error status word 67
Event log data 63
Event types 64
Examples of OBIS identification codes 118
Expanding tree folders 84
Export of data 65, 68, 69
Exporting TOU table 60
Fields of application of the MAP120 9
File handing functions 71

© Landis+Gyr AG

File types 73
First steps 17
Folder handling 44
Formatted IEC commands 107, 109
Formatted VDEW commands 112
Frame length 26
Full text search 87
Functions of the MAP120 9
Further documents 42
General tool settings 88
Group Company Edition 11
GSM installation tree 61
HDLC 123
Head Quarter Edition 11
Help functions 92
Help support 94
IEC 123
IEC commands 107, 109
IEC service tree 53
Ignore baud rate switching 26
Importing MAP190 files 55
Installation of the MAP120 13
Installation tree for GSM 61
Interface to meter 24
Landis+Gyr view of dlms tree 46
Language selection 88
Licence data 15
License key entry 16
Licensing 15
Licensing concept 15
List of abbreviations 123
Load profile data 66
Local multiple connections via RS232/RS485 interfaces 30
Local point-to-point connection via RS232 interface 28
MAP 124
MAP120 Communication Center 21
Marking 48, 53
Marking data in service tree 52
Maximum baud rate 26
Maximum frame length 26
Message bar 85
Meter security system 101
Modem connection 24, 34, 36, 40
Multiple connection 30, 36
Network delays 26
Normal view of dlms tree 45
OBIS identification codes 115
Object identification system OBIS 115
Object selection 72
Opening existing device descriptions 73
Page setup 78
Parameter overwriting protection 101
Parameterisation tree 55
Parameters in service tree 51
Password protection 102

Physical device address 27
Point-to-point connection 34, 40
Previewing the printout on the screen 80
Print layout definition 78
Print preview 80
Print setup 83
Printing device descriptions 76
Problem solving 99
Professional Edition 11
Profile readout 49
Program termination 83
Program version 95
PSTN 124
Purpose of this user manual 3
Reading head 24
Readout of all values with one single command 49
Readout of profiles 49
Reloading configuration settings saved 90
Remote multiple connection via V22bis PSTN modem 36
Remote point-to-point connection via GSM modem 40
Remote point-to-point connection via V34 PSTN modem 34
Remote Service Edition 11
Removing markings 48, 52, 54
Representation settings 47
Reset tree icons 86
Saving a communication profile 18
Saving device descriptions 75
Saving device descriptions under a new name 75
Saving markings 52, 54
Searching items 87
Security attributes 102
Security switches 102
Security system 101
Selecting access level 26
Selecting data in dlms tree 48
Selecting data in parameterisation tree 55
Selecting IEC commands 53
Service Center Edition 11
Service Edition 10
Service tree 51
Setting up a communication profile 18
Setting up the printer 83
Settings for access levels 27
Special functions 88
Special text marks for printout 79
Specified passwords 27
Specifying general tool settings 88
Status bar 85
Status word for errors 67
Stored values 69
Support 99
Support for use of online help 94
Survey types of tree 43
System requirements 13
Target group of this user manual 3

© Landis+Gyr AG

Terminating the program....83
Tool help....93
Tool settings....88
Toolbar....84
Tree for billing values and profiles....50
Tree help....93
Tree items....43
Tree representation....43
Types of files....73
Types of tree....22, 43
VDEW....124
VDEW commands....112
Versions of the MAP120....10
View functions....84
View settings....89
Window arrangement functions....91